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ABSTRACT

The seven-year forecast of vocationally related job openings in the State of Washington from 1976 through 1982 identifies long range, gross demands of vocational education training needs by occupational category. Part 1 provides an introduction and lists major participants. Part 2 describes the system's major features and limitations, and references to available specific technical documentation are made. Part 3 compares the present document with its first edition; compares the present document with the Employment Security Department's Forecast on Occupational Trends; and examines State and vocational education-related job needs and program trends. Part 4 presents the Job Opportunities Forecast in three categories: (1) projected demands for vocational education programs currently offered throughout the State; (2) potential/emerging vocational education programs; and (3) special needs studies and/or specific occupational forecasts. Vocational programs within these categories are arranged under the following occupational areas: agriculture, distributive education, health, home and family life, business and office, technical, trade and industrial. Appended material includes: reference copy of the Employment Security Forecast entitled "Washington State Occupational Trends 1970-1980", glossary of terms, bibliography, and questionnaire. (LH)

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Job Opportunities Forecast for Washington State
1976 - 1982

Washington State
Commission for Vocational Education

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December 1975

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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WASHINGTON STATE COMMISSION FOR VOCATIONAL EDUCATION

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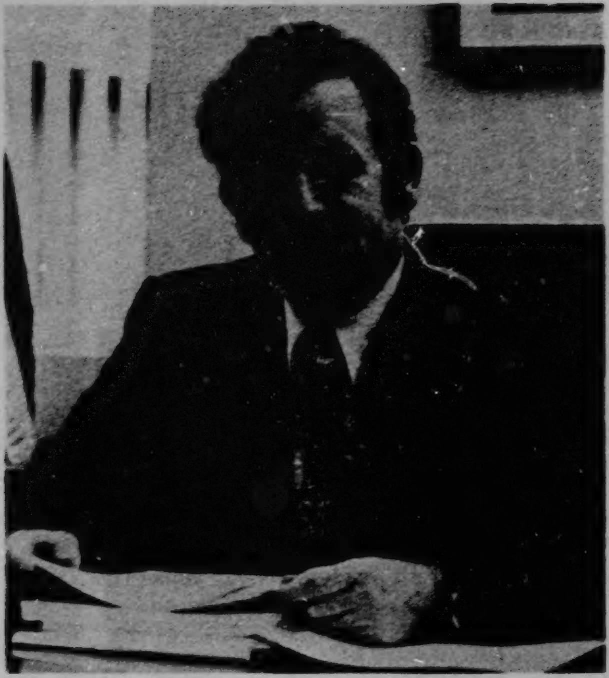
Preface

The earlier first edition of Job Opportunities Forecast was the product of initial effort to develop a seven year occupational forecast to display statewide training needs. Its primary purpose was to provide a statewide vocational education program structure and data base which, when accomplished, was used to establish meaningful trends for the development of guidelines for comprehensive planning activities. The first edition created significant interest and was widely accepted and used at both State and local levels.

The second edition of Job Opportunities Forecast presented here, while still developmental, extends the state of the art. It supercedes and replaces the first edition and provides additional improved information and expanded usefulness. This was accomplished through systems and informational refinements incorporated into the forecast system and through extended coverage to include new vocational education programs.

This second edition is based on the best State and National manpower planning information available; sources of information are identified throughout the document and are referenced to a bibliography in the Appendix to this document.

The Job Opportunities Forecast should be considered as a basic tool for assessing the need for, and the long range planning of, vocational education programs at both State and local levels throughout the State of Washington.



Foreword

Arthur A. Binnie

Executive Director
Washington State
Commission for
Vocational Education

The Washington State Commission for Vocational Education is mandated by State legislation, in accordance with the intent of Federal Public Law 90-576, to serve as the State planning and management agency for Washington vocational education. As such, the State Commission seeks to fulfill a need emphasized by both State and Federal legislation: the need for a statewide system of comprehensive planning for vocational education programs. Simply put, the State Commission's goal is to initiate statewide planning and offering of the right programs and services to the right people in the right places in the right form at the right time for the right costs for the right benefits and results.

There has been an increasing demand for vocational education programs and services throughout our State during recent years. As evidenced throughout this Job Opportunities Forecast, the demand is expected to continue - but it must be met with limited physical and financial resources. Therefore, it becomes increasingly important to plan and offer programs based on documented existing or projected future needs and employment possibilities, for maximum use of the limited physical and financial resources available.

The Job Opportunities Forecast paints a picture of total State need for many types of vocational education programs in the next seven years. It illustrates trends in program growth, maintenance and/or program decline for over 200 vocational offerings. Its information provides a basis for comprehensive annual and long range planning for the coming seven year period so that we can mutually assure that:

1. Schools are providing job training when and where it is really needed, consistent with the needs of citizens, business and industry,

2. Students served by a program will be adequately and appropriately prepared and placed in jobs forecast to be available, and

3. The State's physical and economics resources are being directed and invested in proper target areas to provide the greatest social and economic return possible.

The Job Opportunities Forecast should be viewed as a mutual planning tool. It should be used as a guideline for both State and local planning for vocational programs beginning with fiscal year 1976, for subsequent annual plans, and also for five year planning requirements. All planning should be consistent with the projected demands reflected in this document.

We should work together to improve current information and to reconcile differences, whenever this occurs. The Occupational Education Forecasting System is a cooperative effort of the Commission for Vocational Education, U.S. Office of Education, State Board for Community College Education, State Superintendent of Public Instruction, Interagency Forecast Task Force and numerous other organizations. This continued interagency cooperation will be beneficial in continuously improving the system, as well as, the usefulness of information provided by the Job Opportunities Forecast.

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Introduction

The Job Opportunities Forecast is a seven year forecast of vocationally-related job openings in the State of Washington from 1976 through 1982. Published by the Washington State Commission for Vocational Education, its purpose is to identify long range, gross demand of vocational education training needs, by occupational categories, based on forecasted employment demands.

The Job Opportunities Forecast was developed for use by administrators, planners, counselors, teachers, students and parents interested and involved in vocational education programs. Administrators and planners can use this document for realistic planning, justification of new programs, and for review of need for existing programs. Counselors and teachers will find this publication useful for recommendation of new programs to administration and for guidance and counseling of students to occupational pursuits with the highest demand and best possible potential job placement. Similarly, students and parents can use this document to plan occupational choices.

This second edition of the Job Opportunities Forecast is based on eight primary objectives:

1. Inform users of the purpose, reason, and use of the forecast to support comprehensive planning requirements.
2. Identify the major participants involved in developing the forecast system.
3. Inform users of the background and evolution of the forecast system, its major features and limitations.
4. Provide references to detailed technical documentation and other resource materials.
5. Assist users in the interpretation and understanding of the information and significant major trends presented in the forecast.
6. Provide a comparison to the previous first edition and the forecast of Washington State Occupational Trends, published by the Washington State Employment Security Department.
7. Publish the seven year job forecast for vocational education related occupations.
8. Obtain evaluative feedback on the content, value, use, and distribution of the Job Opportunities Forecast through solicited comments and recommendations for improvement.

To fulfill these objectives, this document is organized into four major sections, followed by an Appendix.

Part 1 - Gives additional introductory and explanatory information on the need and use of the Job Opportunities Forecast, and lists the major participants and supporters involved in the production of this document.

Part 2 - Provides a brief description of the forecast system's major features. It also provides a summary of the system's background, evolution and limitations. References are made to available specific technical documentation for those interested in a more detailed review of the system.

Part 3 - Assists the user to understand the earlier first edition and compare it to this second edition. Also given is an explanation of the Washington State Employment Security Department forecast of Washington State Occupational Trends and its comparison to the job forecast presented here. In addition, an analysis and interpretation is made of the numerical projections (Part 4) of this Job Opportunities Forecast, summarizing significant major trends in vocational education fields and programs. This analysis is included to expand the usefulness of the forecast information for subsequent analysis and planning purposes.

Part 4 - Presents the actual Job Opportunities Forecast organized into three major sections. Section 1 reflects the projected demand for all existing vocational education programs for each year of the seven year forecast period. Section 2 projects the demand for potential or emerging vocational occupations not currently served by present vocational programs. Section 3 summarizes known supplemental or special studies, specific occupational needs assessments, and special occupational forecasts conducted by various professional organizations, trade associations, contractors and private individuals. This is provided as a reference for persons interested in obtaining and using this additional needs assessment and forecasting information.

The Appendix includes a glossary of terms used in this publication, a bibliography of manpower publications, a reference copy of the Employment Security Forecast, and a questionnaire. The questionnaire is included:

1. To obtain comments and recommendations for improving the document; and

2. To maintain the names and addresses on the mass distribution list.

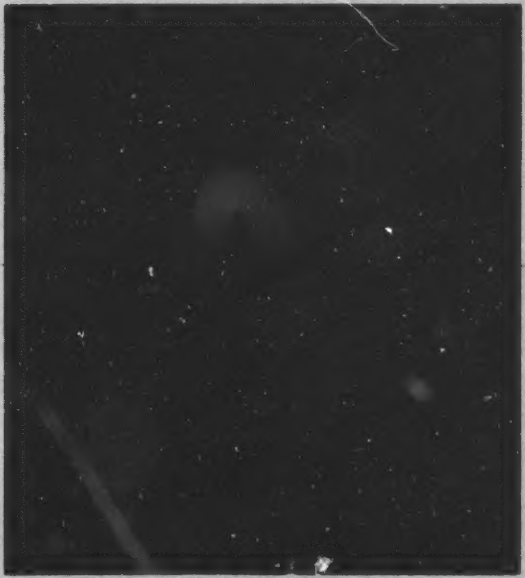
We appreciate your interest and use of this publication and welcome your responses.

Endorsements

John Mundt

Director
State Board for
Community College Education

The State Board staff views the Job Opportunities Forecast as an essential informational source for successful annual and long range planning and budgeting of vocational education programs. The Forecast provides a valuable management tool which should be continuously used to support decisions and effect improvements in vocational education programs throughout the State of Washington. This second edition of the Forecast will continue the significant planning and budgeting improvements effected throughout the community college system through use of the first edition.



Dr. Frank Brouillet

Superintendent of
Public Instruction

One of the most critical and continuous needs of Washington's school districts and their State office is to improve the basis by which we develop and produce annual and long range plans and budgets. Information derived from the Job Opportunities Forecast, along with local advisory committees, provides essential information to develop meaningful annual and long range plans and budgets to implement vocational education programs where they are most needed.

Acknowledgements

Washington State Advisory Council on Vocational Education

Emmett Nelson
Chairman

Dennis D. Coplen
Executive Director

The Washington State Advisory Council on Vocational Education acknowledges the Second Edition of Job Opportunities Forecast as an initial, positive step toward developing a statewide vocational education needs assessment and comprehensive planning system. This forecast document is a meaningful response to recommendations such as the following which have been made by the Washington State Advisory Council on Vocational Education in its Annual Evaluation Reports:

Recommendation:	". . . assign a high priority of staff and funding for the field testing, refinement and, expansion of its present efforts to relate manpower requirements to vocational enrollments."
Recommendation:	". . . further refine and implement its (Commission for Vocational Education) promising forecasting model."
Recommendation:	". . . improve the range and comprehensiveness of its (Commission for Vocational Education) planning effort in order to develop more meaningful directions and improved action plans."

Hopefully, State and local vocational education planners will effectively utilize the information, trends, and guidelines resulting from the Second Edition of the Job Opportunities Forecast. The Advisory Council also looks forward to significant evidences of this document being used in formulating the major goals, objectives, and plans contained in subsequent annual and long-range plans for statewide vocational education programs.

Appreciation

The Washington State Job Opportunities Forecast was produced by the Commission for Vocational Education (CVE), Arthur A. Binnie, Executive Director, and assisted through a contract with The Human Resources Planning Institute (HRPI) in Seattle, Washington.

Special appreciation is expressed to Frank H. Wimer, Deputy Director, of CVE, who conceived the original forecast system and initiated the current modifications to the system. Mr. Wimer also provided many valuable comments during the current modeling effort. Laurence H. Flinn acted as project director for CVE. Additional thanks are expressed to Richard G. Moe, Raymond Harry and Earl Hale of the State Board for Community College Education for their assistance in the specification of the pertinent vocational programs. Raymond Harry was especially instrumental in the preparation of assignments codes needed to relate the vocational programs to the employment categories of the census. The economic category forecasts were developed by David Weig of the Washington State Department of Revenue. The Interagency Task Force also provided essential guidance and overall systems planning. Specific recognition of key task force members include: John Walker of the Office of Program Planning and Fiscal Management; Ron Wahlers and Jay Allen of Employment Security; and Lyle Tinker of the Office of Community Development. The names of these and all other task force members are contained on the next page.

The current forecasts were produced on a computer model, the Occupational Education Forecasting System. The HRPI staff responsible for the development of this system and the current Job Opportunities Forecast were: Marc Reeder, project director; Shannon Davis, programmer; and Eric Swanson, economist. Theodore Lane, president of HRPI, acted as special adviser to the project.

Interagency Forecast Task Force

This task force was organized to formulate the general policies and guidelines for the forecast system specifications and design. This task force was made up of key representatives of each state agency concerned with manpower planning. The membership of and consultant to the interagency task force is outlined as follows:

Organization/Address/Phone Number	Name/Title
Commission for Vocational Education Building 17, Airdustrial Park Olympia, Washington 98504 753-1300 (Scan 234-1300)	Frank H. Wimer, State Deputy Director Harold S. Anderson, Administrator Laurence H. Flinn, Project Director
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Interagency Forecast Task Force (continued)

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The Inter-Agency Task Force at one of the many meetings held to discuss Job Opportunity Forecasting.

Occupational Education Forecasting System

Frank Wimer

Deputy Director
Commission for
Vocational Education

Background and Evolution

This part of the document provides a general description of the background, features and limitations of the Occupational Education Forecasting System. In recent years there has been a great deal of pressure on vocational educators to assure that the programs are consistent with the expected job opportunities. Vocational education has always had to justify its programs while many other more traditional educational programs tended to go unquestioned.

Legislators, state budget agencies and the general public are becoming more concerned over the benefits of programs and there is increased competition for scarce funds.

The critical questions which need to be answered are:

1. "Which new programs should be implemented?"

2. "Which present programs should be expanded?"

3. "Which present programs should be reduced?", and/or

4. "Which present programs should be eliminated?"

In dealing with these decisions, there are two extremes: one being the posture a good many educators subscribe to - that if more students enroll, more sections should be offered.

The other, promoted by some of the special programs by labor, is that when a job opening is identified you should locate an unemployed person and put him in intensive training for that job.

Neither is totally defensible, but the latter is more easily understood, has immediate payoff, and the benefits are more easily measured.

The appropriate concept is a compromise somewhere between the two.

When vocational administrators can successfully predict the future work force mix, the kinds of skills required, the trends in job opportunities, and adequately communicate this knowledge to the general public, teachers, parents, counselors, and students, then and only then can student demand be the only basis for decisions regarding program growth.

In a democratic society the job opening, unemployed person, and training pattern is unacceptable. People must have the right to choose, but that choice must be conditioned by adequate information. This means that long term trends and specific demand information must be developed and usable by all who need it.

If employers are questioned regarding their future plans for new hires, their response is usually very optomistic or the response is conditioned by today's new contract or by today's loss of a big order. Employers usually over-estimate the need, and labor leaders usually under-estimate the need. The best estimate is somewhere between.

Under federal vocational laws, the responsibility for providing employment forecasts was assigned to the U.S. Department of Labor and to the State Employment Security Departments. Whereas these forecasts were usable to vocational education planners on some occupations, additional refinement was necessary to gain the needed information on all the occupations requiring specialized or unique vocational education programs and services. This was needed to assist vocational education administrators and planners to perform their long range planning requirements.

Therefore, it was determined that a vocational education forecast should be produced which would relate industry and occupational demand to unique vocational education programs. There were also concerns from schools that the planning and allocation process was too much State dominated - that it was top down rather than by mutual agreement. So a companion project was developed which involved the community college local directors and other community college administrators to determine a planning and allocation procedure.

This was developed into a total Occupational Education Forecasting System, of which there are three major components. The three components are:

1. The Job Opportunities Forecast
2. The Management Program Control Report, and
3. The Management Statistical and Trend Report

General Description

A complete technical documentation is available on the total Occupational Education Forecasting System for persons requiring specific and detailed systems and programming information. The purpose here is to provide brief and summarized descriptions.

Job Opportunities Forecast

In developing the forecasting component it was determined that:

- Standard data sources should be used rather than collect more data.
- That those whose plans and programs would be affected must be parties to designing the decision process.
- That State agencies making decisions regarding programs (Council on Higher Education, State Board for Community

College Education, Superintendent of Public Instruction, Washington State Commission for Vocational Education); that agencies making fund appropriations decisions based on forecast data (State Budget Agency, Population Statistics, Planning, Budgeting); and those involved in providing base data (Employment Security, Department of Revenue) must all be party to determining the assumptions upon which a forecast was to be based and the process to be used.

All of these agencies realized that even though the forecast numbers may not be perfect, each could use the data because it is the best data available. The commitment was to use this data, and through working as a team continue to improve the data. Therefore, an Interagency Forecast Task Force was organized to develop and approve the general policies and guidelines for the Forecasting Systems specifications and design. This task force was made up of representatives for [illegible] State agencies involved and concerned with human resources - manpower planning and development. A listing of the agencies and the names and positions of these task force members is contained in Part 1 of this document.

In this project, rather than to survey a sample of employers as to their expected demand, and to construct totals based on the samples, it was decided to base the projections on more gross projections of the future. For control totals of future employment levels, the official Washington State Long Range Economic Forecast of employment by major industries was used.

To determine how that employment would be distributed within the various occupations and within the various industries, the 1970 Census of Employment was used. When the 1970 census was taken, persons were asked what kind of work they did and where they worked. This data was then classified by occupation and industry, from which appropriate rates were determined to determine relative percentages with the total labor force.

The U.S. Department of Labor has produced a computer tape for each State called the Industry/Occupation Employment Matrix (see sample on page 20). The data from the 1970 census is in this matrix form, with 440 occupational categories and 227 industry classifications. Each cell contains the number employed in that occupation in that industry at the time the census was taken. There is a relationship between each cell and the total of all cells for a particular occupation or a particular industry.

These relationships are used to produce a new matrix in which the cells reflect the new projected level of employment based on the previously indicated State Economic Forecast.

A new matrix is then produced to indicate the projected level of employment for each year of the forecast period. By summing the growth in each of the cells, plus the replacement (due to deaths and retirements) for that year, a demand for new hires for a particular occupation for a particular year is produced.

In order to display data which corresponds to the vocational education programs, a vocational education code to census code relating table was produced (see relating table sample on page 21). This was done by determining which occupations in which industries are related to a particular vocational education program.

By using this coding and the previous mentioned process and through computer programs, projected demand is computed for new hires by vocational education program. This information was initially published in late 1973 as the red-covered document entitled "1st Forecast, Job Opportunities in Washington State, 1975-1981". The second edition is contained in this publication, and it is planned that future editions will be updated and published annually.

Management Program Control Report

This component also has an impact on the vocational program decisions. The actual reports and detailed documentation is published in a separate document. The reason for a brief discussion of this program, at this point, is to inform readers of the additional dimension and capability that is built into the total system. To make recommendations regarding program growth, an analysis and comparison is made as to what is currently happening in each occupational program, regarding enrollments, completions and placements. This information is then related to and compared with the projected demand. An illustration of how this is accomplished using a sample analysis form is contained on page 21.

In column #3 record the past year's total preparatory enrollment in the occupational program; and in column #4 record the past year's placements into jobs in the occupation or a directly related occupation as reported in October. The ratio of enrollments to placement is then calculated by dividing enrollments by placement and recording it in column #5.

The projected demand for the same year is recorded in column #7. The percent of demand being met by the placements is calculated by dividing the placements by the demand and recording the percent in column #8. This specific information base provides the basis for making management recommendations for growth, maintenance of effort, review and/or reduction in the various vocational education programs, based on this analysis.

To recommend that a program should grow, the enrollment to placement ratio should be low; that is, there is good placement. Also, there must be significant demand for new hires. In addition, there must be a significant unmet demand. All three conditions must be met in order to recommend growth in a program. Included are some constructed data elements to illustrate.

Using the "constructed" data for diesel mechanics on page 21, we find there is good placement; there is a significant demand; and there is unmet demand. Therefore based on this information and the conclusions from the analysis, the management recommendation would be to fund for growth.

Using the "constructed" data for customer service representative, the placement is fair; there is not a great demand; and there is not a great unmet demand. Therefore the management recommendation would be to maintain the present level.

Using the "constructed" data for radio/TV repair, the enrollment to placement ratio is high - that is, very poor placement. Therefore the management recommendation would be to review the program to determine why there is poor placement, correct any problems, reduce the enrollments, or even close down the program. For this particular example, in many States this recommendation would have been entirely different. There is an unmet demand. This data indicates only 1.7% of the demand is being met, and unless other factors are used, the recommendation would have been to fund growth. Funding growth here would have not solved the problem.

Management Statistical and Trend Report

This component produces another tool used to aid in the decision making process. The actual reports and detailed documentation is published in a separate document. The reason for a brief discussion of this program, at this point, is to inform readers of this additional dimension and capability that is built into the total system. There is a chart with statistical back-up for each occupation showing trend lines, both historical and future projections, (see sample chart on page 22).

This chart shows trend lines of actual total enrollments, actual first year enrollments in a two year program, actual completions, and actual placements. The projections (or the objectives) expected to be accomplished in the future for each of these items can also be plotted on the chart.

In this display, there is one more significant item - a "potential" enrollment line. This line is calculated to indicate what the level of enrollment would be if there were a direct relationship between the work force mix and the school enrollment mix. It is based on the assumption that the skills being developed by students in a comprehensive school system should reflect the skills of the world in which the student will live and work.

The previous described analyses and the trend line charts can each be used at both the state level and within a particular school as an aid in making program decisions.

Limitations

Although this project is primarily concerned with job opportunities, vocational educators are cautioned not to become too enamoured with this manpower forecast for all decisions. Of necessity, these are estimates of job demand. As such these figures should be used as general guidelines to establish long term directions and emphasis to future program planning. Also, other factors, which should be considered as being equally important, are the needs of students and public policy concerns.

In addition, these job projections are for the State of Washington. There may be special local conditions in certain geographic areas which cannot be indicated in a total statewide projection. Therefore, it is also important that local advisory committees be utilized by schools to provide additional information and assistance in determining the local vocational education program needs and directions for the specific localities. In addition, the Job Opportunities Forecast represents only the gross demand side of the labor picture. Therefore, to have a meaningful indication of true (or net) demand, the supply side must also be considered.

The supply side of the labor picture is extremely difficult to totally identify and quantify. It includes all persons who are or will be trained and available to the labor market through existing vocational education program resources and capabilities. Included are public and private school vocational education programs, migration, apprenticeship programs, as well as military and employer training programs.

Therefore, for realistic estimates, a close coordination should be made with the appropriate education agencies and other organizations which supply trained persons for these occupational demand categories. Needs should be compared in total, as well as, over each year of the five year period. A major portion of supply estimates can be developed by:

1. Identifying the number of public and private schools providing training in various vocational education programs.
2. Determining the estimated maximum number of trained students who will be supplied through each school system.
3. Develop assumptions and/or conduct surveys to determine supply estimates through migration, apprenticeship, as well as, military and employer organizations.

This comparison of the estimated supply of people trained in each occupation to the total (gross) demand, will result in an estimate of net demand. This net demand, then provides the needs information for vocational education program planning, at both State and local levels.

Major publications identifying the various public and private schools offering vocational education programs recommended for use as a guideline in determining supply estimates are listed as follows:

1. Career Choices in Occupational Education, published by the Commission for Vocational Education, Olympia, Washington, revised reprint 1975.
2. Career Training Opportunities in the State of Washington, Published by the Commission for Vocational Education, Olympia, Washington, revised reprint 1975.
3. A Guide To Apprenticeship Opportunities in the State of Washington, published by the Coordinating Council for Occupational Education, Olympia, Washington, February, 1975.
4. Vocational Education Programs in Washington Community Colleges, published by the State Board for Community College Education, Olympia, Washington, 1975.
5. The V-TI Story, published by the Washington State Association of Area Vocational Technical Institutes, Tacoma, Washington, 1975.

Copies of the above publications are available and may be obtained by writing to:

Commission for Vocational Education
Curriculum Management Center Library
Olympia, Washington 98504

Further, in developing a forecast system of any complexity, numerous assumptions and design decisions must be made. The mathematical model which generates the forecast is, by definition, an approximation of a real economic system. Thus, in order to better appreciate the values displayed on the forecast tables, a few words are desirable to explain some of the major assumptions and the additional limitations they impose on the forecast results.

The model is designed around the census data. Thus, some limitations are imposed on the forecasts at the start, quite apart from the internal computations of the model. This is not the place to review the census's methodology, but it should be pointed out that the manpower tallies of industry-occupation employment are based on a sample and, therefore, can be expected to contain small random errors. Also, the classification of each respondent to the census survey into a particular industry-occupation cell is not perfectly certain. Not only is the judgment of the census tabulator involved, but the industry designation of a particular firm may change abruptly.

There is a natural tendency of respondents to upgrade themselves when specifying their occupational category. Thus, a person who works as a typist might classify themself as a secretary. Similarly, individuals may possess more than one skill: they may work mostly in occupation A, but also in occupation B. The census only records the industry which most of a firm's products fall in and the principal occupation of each person. These discrepancies in the classification system become apparent when reviewing the tabulation of the 440 census occupations. Several categories forecast no workers. Examples of this are political scientists, sociologists and economists. This is because people in these categories were classified elsewhere in the 1970 census tabulation. Also, a number of categories have workers allocated from a pool of workers whose classification was uncertain from the information given on the census questionnaire. These categories are termed "allocated" or "not specified."

The consequence of all of this is that in a few cases the employment forecast produced by the system yields values that differ significantly from other available surveys and labor employment reports. These problem areas should be identified and tagged for additional review. Perhaps staffing ratios can be generated from sources other than the census and entered into the model to update the problem census data. In any case, even though these census limitations are sometimes perplexing, it should be kept in mind that they represent only a tiny minority of the huge body of data that the census provides.

There are basically two versions of these census data: the original version prepared by the Bureau of the Census and the reformatted version prepared by the Bureau of Labor Statistics, BLS. The present forecasting system uses the original version. However, it may be desirable in the future to modify the system to use the reformatted version because of change factor matrices being developed by BLS. These change factor matrices, when applied to the 1970 census data, yield estimates of 1980 occupational employment. This feature will be especially desirable in trending staffing ratios over the forecast period rather than using the 1970 staffing ratios in all forecast years as is now done. Also another set of change factors are being developed by BLS that will produce a "cleaned-up" version of the 1970 census. It seems a desirable objective of future system modifications to make use of these change factor matrices when they become available.

In order to prepare the current forecasting system with its use of the original census tape to be in line with the reformatted census tape, the capability to exclude selected industries and occupations has been incorporated. The reason for this is that several categories, so-called "allocated" and "not specified" categories, present in the original census tabulation have been excluded in the reformatted tabulation. Thus, if desired, the present system can also exclude these categories from the totals upon which the staffing ratios are computed. The decision whether to make use of the exclusion feature will have to be made as part of the occupational assignment procedures.

Another trending feature that is indicated as a future system modification will be year-by-year trends of replacement rates. The present system computes the replacement rates for each OE-Program through an employment weighted average of the several 1970 census category replacement rates applicable to that OE-Program. This, in itself, is a great improvement over the cruder methods of estimating OE replacement rates used in earlier versions of the forecast system. However, the availability of 1980 estimated census employment, together with published 1985 estimates of census category replacement rates, will allow computation of a separate set of 1980 replacement rates for each OE-Program. Thus, a trending of replacement rates for years between 1970 and 1980 will be possible.

The above discussion concerned limitations of the census input on the forecasting system. Another type of system limitation centers on how the model adapts the census input in making OE-Program forecasts. The various assignment code decks are at the heart of this process. It is up to the user of the model to generate an appropriate set of correspondences between the census categories and the set of OE-Programs for which forecasts are needed. The degree to which the forecasts capture actual employment applicable to the OE-Programs is determined to a great extent by the amount of skill that is brought to bear on the generation of the assignment codes. It should be kept in mind that no matter how sophisticated the internal algorithms of the system are in producing a forecast, if the assignment codes are not appropriate then the forecasts will be unsatisfactory. This introduces another limitation. These code assignments are made on a judgmental basis. This is done by interpreting the meaning of the industrial and occupational title listed in the 1970 census and relating these interpretations to the title and description of an OE-Program.

In addition, other coding problems impose limitations on the acceptability and usefulness of the forecasts. An example of the type of problem that the person determining the assignment codes must face centers around the use of shared or coefficient assignments. In some cases several OE-Programs seem to apply to the same set of census occupational and industry categories. In these cases the employment from the set of census categories is shared among the several OE-Programs according to a set of coefficients. But what values should be specified for each coefficient? In lieu of any "hard" data from which to derive coefficients the code preparer is forced to estimate values. Often these estimates result in equal shares to each of the several OE-Programs. While the estimation of coefficient assignments in this manner is often the best available coding method, it is not always clear that these "ad hoc" coefficients will produce acceptable forecasts. Thus, special attention should be paid in the review of forecast values produced with this type of coefficient.

It is clear that the code preparer needs more information upon which to base the decisions and assumptions that are part of the code generation process. The Bureau of Labor Statistics has published a table of conversions from the occupational titles in the BLS national matrix to the Vocational Education Classification system. Also the Office of Education (HEW) and the Manpower Administration (DOL) have published an index of vocational OE-Programs and their correspondence to occupational categories in the Dictionary of Occupational Titles (see bibliography in appendix). Although these references are of great assistance in preparing assignment codes for many OE-Programs, the detail is often not fine enough to satisfy all assignment problems. These references are national in scope and do not pick up the deviations to national trends in the local mix of industry and occupational employment. What is needed, but usually not available, is a survey of the local designers of each OE-Program to determine in which industry and occupational areas graduates of their courses are most likely to be employed. Also, follow-on surveys are needed to determine in which occupations and industries graduates were actually employed.

In concluding this section on system limitations some brief mention should be made on the importance of realistic forecasts for the economic categories which are supplied as input to the demand forecast. The values specified for these categories are usually coordinated with statewide employment forecasts and, therefore, very little leeway is permitted in making revisions to the forecast values. Thus, if the economic category forecasts fail to capture realistic trends in State employment so do the vocational forecasts of this system.

Refer to Page 13 for Explanation

227 INDUSTRIES

440 OCCUPATIONS

	017	018	---	118	119	---	257	258	---
001									
002									
003									

192									
193									
194									

OE CODE/CENSUS CODE RELATING TABLE

Refer to Pages 13 and 14
for Explanation

1 OE CODE	2 PROGRAM TITLE	3 1970 CENSUS CODES Occupational Codes	4 Industry Codes
17.12.00	Diesel Mechanic	481	All
04.20.00	Customer Service Rep	260, 261, 262, 264, 281, 282, 283, 284, 285, 296	448, 449, 467, 468, 469, 477, 478, 479
16.04.99	Radio/TV Broadcaster	192, 193, 184	All

JOB OPPORTUNITIES IN WASHINGTON STATE: 1975-1981

1 OE CODE	2 PROGRAM TITLE	3 Projected Demand 1975	1976	1977	1978	1979	1980	1981	4 % of Ave Empl-1970	5 % of Total Demand-1975
17.12.00	Diesel Mechanic	286	294	302	311	320	330	340	.649	.343
04.20.00	Customer Service Rep	24	25	26	27	27	28	29	.037	.029
16.04.99	Radio/TV Broadcaster	181	186	192	198	204	210	217	.301	.217

Example Only

ANALYSIS

1 OE CODE	2 PROGRAM TITLE	3 Preparatory Enrollment	4 Placement	5 Enrollment Per Placement	6 Recommendation	7 Demand	8 Percent of Demand Met
17.12.00	Diesel Mechanics	380	151	2.5	G	280	54
04.20.00	Customer Service Rep	94	20	4.7	M	25	80
16.04.99	Radio/TV Broadcaster	60	3	20.0	R	180	1.7

Refer to Page 15 for Explanation

CHART #F/C 2-72

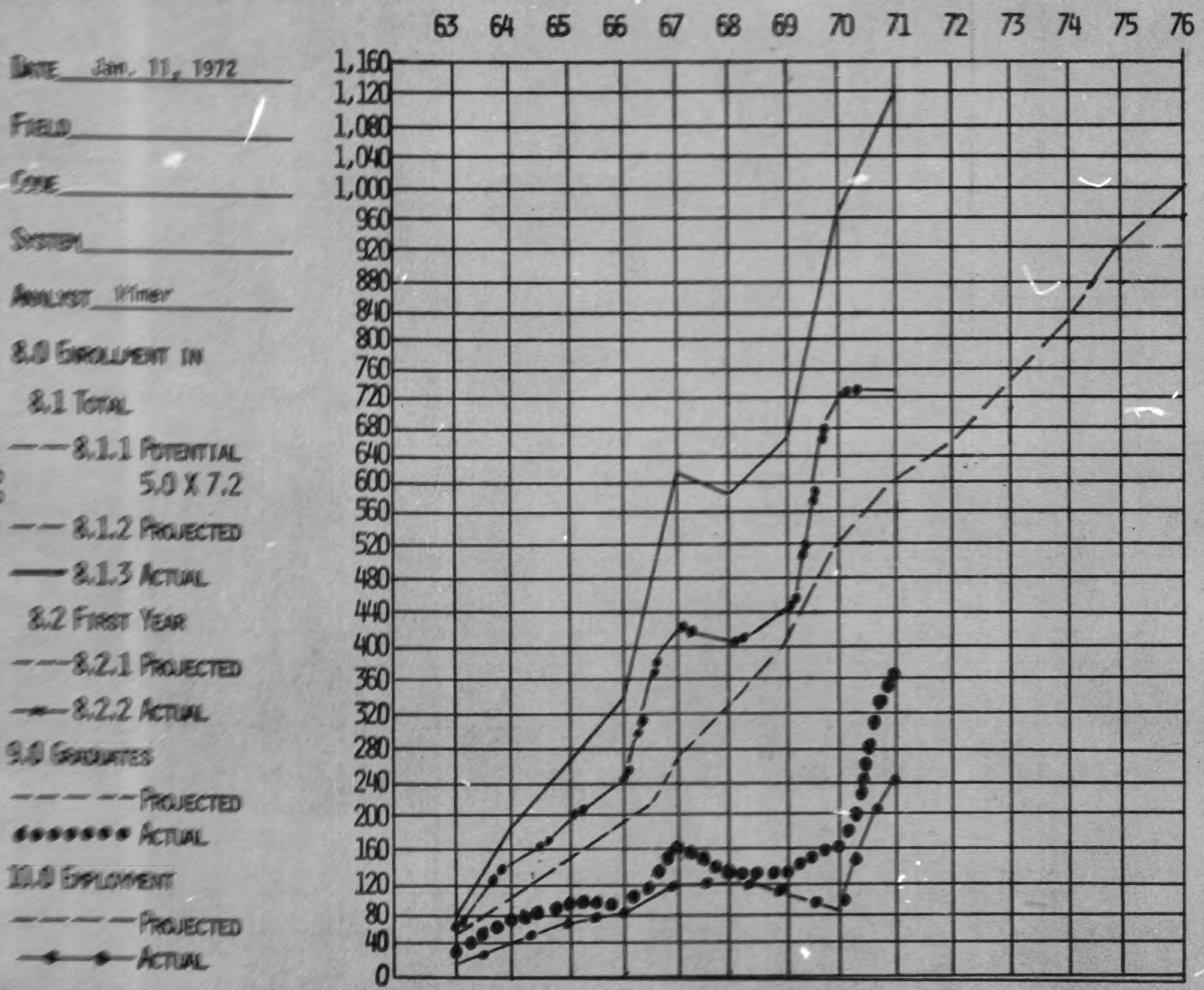
DATE Jan. 11, 1972

FIELD

CODE

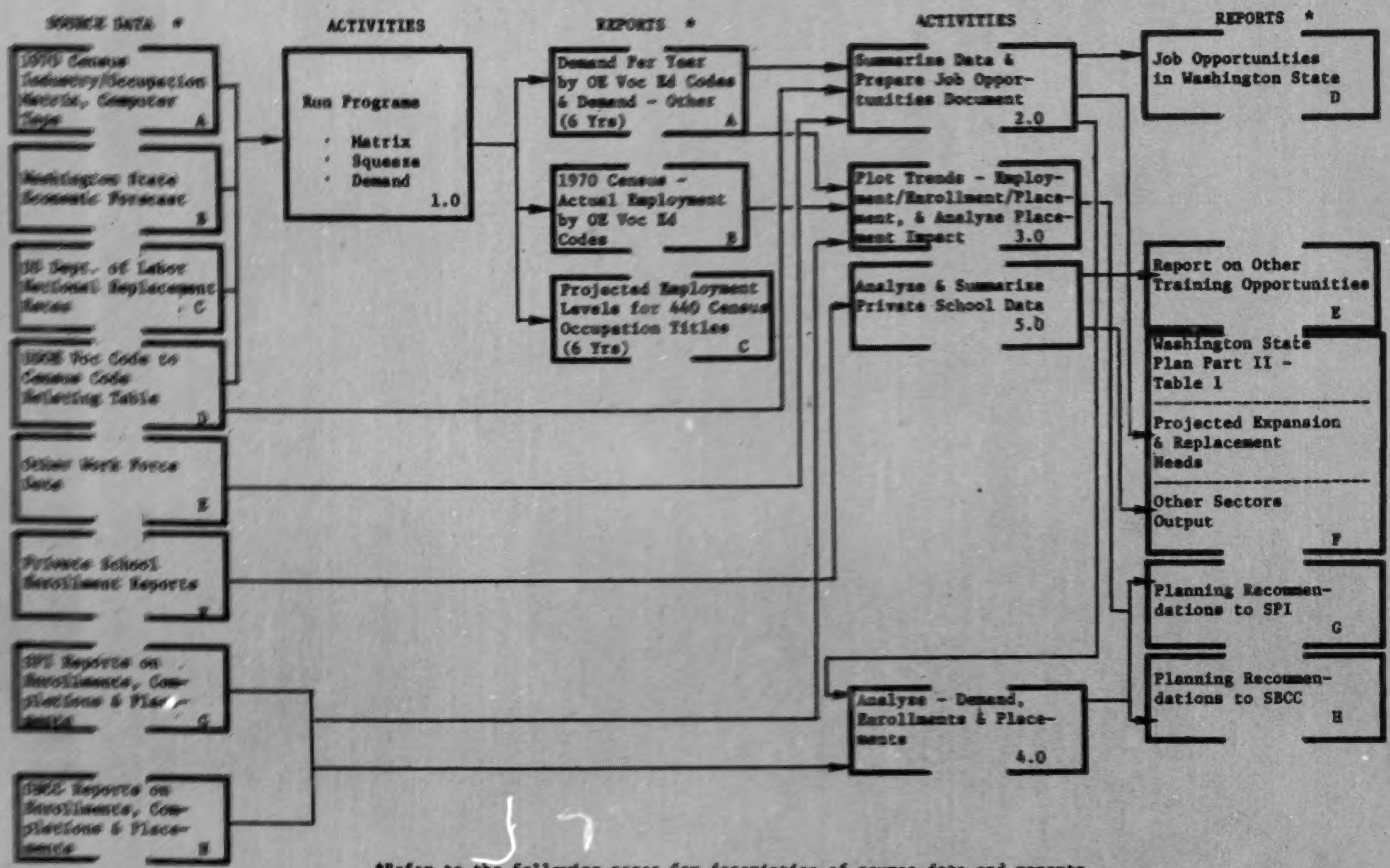
SYSTEM

ANALYST Winer



11-5-75

VOCATIONAL EDUCATION FORECAST PROCESS


SOURCE DATA *
1970 Census Industry/Occupation Matrix, Computer Tape A
Washington State Economic Forecast B
US Dept. of Labor National Replacement Rates C
USOE Voc Code to Census Code Relating Table D
Other Work Force Data E
Private School Enrollment Reports F
SPI Reports on Enrollments, Completions & Placements G
SBCC Reports on Enrollments, Completions & Placements H
ACTIVITIES
Run Programs
· Matrix
· Squeeze
· Demand
1.0
REPORTS *
Demand Per Year by OE Voc Ed Codes & Demand - Other (6 Yrs) A
1970 Census - Actual Employment by OE Voc Ed Codes B
Projected Employment Levels for 440 Census Occupation Titles (6 Yrs) C
ACTIVITIES
Summarize Data & Prepare Job Opportunities Document 2.0
Plot Trends - Employment/Enrollment/Placement, & Analyze Placement Impact 3.0
Analyze & Summarize Private School Data 5.0
Analyze - Demand, Enrollments & Placements 4.0
REPORTS *
Job Opportunities in Washington State D
Report on Other Training Opportunities E
Washington State Plan Part II - Table 1
Projected Expansion & Replacement Needs
Other Sectors Output F
Planning Recommendations to SPI G
Planning Recommendations to SBCC H

*Refer to the following pages for description of source data and reports

DESCRIPTION OF SOURCE DATA

Shown on Preceding Flow Diagram of Vocational Education Forecast Process

Source Data

A - 1970 Census Industry/Occupation Employment Matrix for Washington State, Computer Tape available from the U.S. Department of Labor, Bureau of Labor Statistics.

B - Washington State Economic Forecast available from the Department of Revenue. This is a forecast of employment levels in Washington for 28 industries and for 1976 and 1982.

C - U.S. Department of Labor Replacement Rates - Bureau of Labor Statistics, *Bulletin #1606, Volume I, Developing Area Manpower Projections*, 1971, U.S. Government Printing Office (Washington, D.C.), pages 47 - 58.

U.S. Department of Labor, Bureau of Labor Statistics. *Tomorrow's Manpower Needs* - Supplement No. 4, *Estimating Occupational Separations from the Labor Force for States*. Washington, D.C.; U.S. Government Printing Office, 1974.

D - U.S.O.E. Vocational Code to Census Code - Relating Table, developed by the Washington Commission for Vocational Education.

E - Other Work Force Data - See References, Source Data E.

F - Private School Reports - Enrollment Report from the Washington State Private School Advisory Committee on Vocational Education.

Reports on Enrollments in Private Schools that Enroll Students Receiving Veterans' Benefits.

G - Superintendent of Public Instruction - Reports on Enrollments, Completions and Placements. Federal Report, O.E. Form 3138 (12/74); SPI Report, Computer Print-out VT-50.

H - State Board for Community College - Reports on Enrollments, Completions and Placements. Federal Report, O.D. Form 3138 (12/74); Community College Preparatory Program Inventory Cards.

E

OTHER WORK FORCE DATA

Manpower Report to the President, page 203, Table A-1 - Civilian Labor Force Employed, April, 1971.

Occupational Trends - Washington State , 1970-1980, Washington State Department of Employment Security, July, 1974.

Occupational Outlook Handbook, Bulletin #1650, 1970-1971 Edition, U.S. Department of Labor, Bureau of Labor Statistics.

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Health Manpower Source Book, Section 21, Allied Health Manpower 1950-1980, U.S. Department of Health, Education and Welfare, Public Health Service, National Institutes of Health.

Professional Nurses in Washington State, A Comparison 1970-1969-1961-1957, Ilse J. Volinn, Ph.D., June, 1971.

A Guide to Health Manpower Resources, 1970, Washington State Planning and Community Affairs Agency and Washington State Department of Social and Health Services.

Questionnaire Study on Registered Nurses in the State of Washington, Washington State Board for Vocational Education, 1961.

Health Manpower Supply, Ilse J. Volinn, Ph.D., Washington State Department of Social and Health Services, November, 1971.

Health Manpower and Facilities, State of Washington, 1968, Health Planning Series No. 2, Washington State Planning and Community Affairs Agency, March, 1969.

"Monthly Labor Review," May, 1970, U.S. Department of Labor, Bureau of Labor Statistics.

"Science Education News," October, 1971, American Association for the Advancement of Science.

Also Reference the
Bibliography in the
Appendix for other
General References

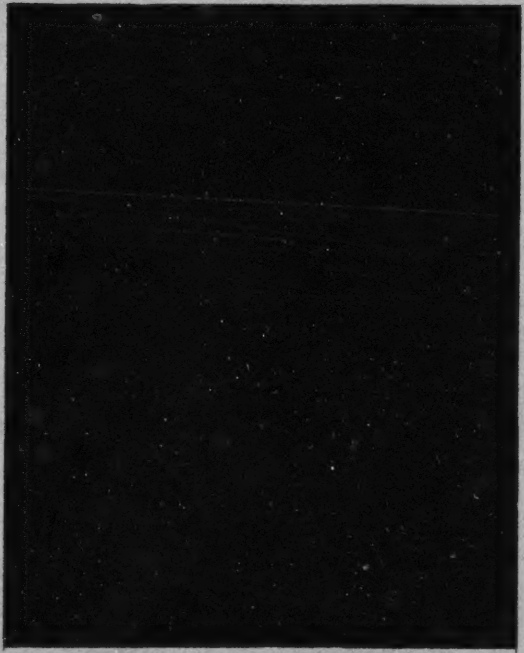
DESCRIPTION OF REPORTS

Shown on Preceding Flow Diagram of Vocational Education Forecast Process

Reports	
A-B-C	Computer Print-outs on file in the Washington Commission for Vocational Education - Management Services Division - Produced by the Human Resources Planning Institute using the University of Washington Computers.
D -	Job Opportunities Forecast in Washington State 1976-1981 - typed and printed by the Washington Commission for Vocational Education - Management Services Division - and distributed to all Vocational Administrators in Washington State and Others upon request.
E -	Report on Other Training Opportunities - a Matrix prepared by the Washington Commission for Vocational Education - Management Services Division - showing Voc-Tech Institute and Private School Enrollments by O.E. Vocational Code and Title and by County.
F -	Washington State Plan for Vocational Education, Part II - Table 1. This is a summary of Projected Demand, Vocational Programs Output and Other Sectors Output. The "Projected Demand" is a summary from Report D; "Other Sectors Output" is a summary from Report E. Vocational Programs Output will be entered after summarizing the plans received from all Vocational Agencies.
G-H -	Planning Recommendations to Superintendent of Public Instruction and State Board for Community College Education. Separate recommendations to each agency, since the Enrollment/Placement ratios will be different.

Harold S. Anderson

Administrator
Management Services Division
Commission for
Vocational Education



Laurence H. Flinn

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Management Services Division
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FORECAST ANALYSIS

This analysis includes three major topics. These are: (1) A comparison of the Second Edition of the Job Opportunities Forecast to the first edition; (2) a comparison of this second edition to the Employment Security Department's Forecast on Occupational Trends; and, (3) State and vocational education related job needs and program trends. Each of these topics is presented in this same order, as follows.

COMPARISON TO THE FIRST EDITION - JOB OPPORTUNITIES FORECAST

The first edition contained 187 occupational education programs. Of this total, 136 programs were in Section I, representing existing and currently offered vocational education programs. Fifty-one programs were contained in Section II representing the number of potential or emerging vocational education programs.

The second edition contains 201 vocational education programs. Of this total, 168 programs are forecast in Section I, and 33 programs are now contained in Section II. The following summary reflects the field and program breakdown and comparison between the first and second editions of this forecast.

SUMMARY AND COMPARISON

	First Edition	Second Edition
O.E. Programs	187	201
Section I	136	168
Programs		
Agriculture	11	11
Distributive Education	16	18
Health	21	28
Home and Family Life	6	5
Business and Office	20	23
Technical	14	25
Trade and Industrial	48	58
Section II	51	33
Programs		
Agriculture	2	0
Distributive Education	9	3
Health	3	2
Home and Family Life	1	0
Business and Office	8	3
Technical	2	2
Trade and Industrial	26	23

In analyzing the above summary, the greatest and most significant change in Section I programs are the increases in Health Occupations, Technical Occupations and Trade and Industrial Occupations. The primary reasons for program increases are primarily due to further definition and refinement of gross program information contained in the first edition. Also, further informational and system improvements were effected. This resulted in more discreet occupational groupings. From this additional and new programs were identified and included.

The primary cause for changes in Section II were due to improved information obtained since publishing the first edition. This provided a basis for transferring many programs previously in Section II to Section I. This resulted in improving the coverage of existing vocational education programs in Section I. This also improved the accuracy of Section II of this forecast for potential emerging programs.

MAJOR CHANGES AND IMPROVEMENTS

Major changes and improvements have been incorporated into the Occupational Education Forecasting System. These revisions are the causes behind the significant changes between this edition and the first edition of the Job Opportunities Forecast. A summary of these revisions is as follows:

1. The number of O.E. programs included in Section I was increased from 136 to 187. This provides additional information, more discreet categories and a better basis for program planning.

2. The number of O.E. programs with data not available (DNA) was reduced from approximately forty to zero.

3. New job replacement rates have been computed which improve the accuracy of the forecast quantities.

4. New and additional industry, occupationa, and O.E. program code assignments have been improved, which also improves the accuracy and coverage of the forecast O.E. programs and quantities.

5. Total demand for each O.E. program is further broken down to specify: net demand due to industry and service growth and expansion; and, the net demand due to replacements caused by persons leaving the work force.

6. New and updated state economic forecast information was incorporated with more relevant business and service economic categories. These economic categories were increased from 22 to 27 economic groupings.

7. A new feature for allocating demand to multiple O.E. programs was also incorporated providing for improved forecast in O.E. programs and quantities.

8. Part 1, 2 and 3 of this document have been added to provide additional information to improve the readers understanding and use of this document.

Significant changes in the demand figures expressed in this edition in comparison to the first edition are due to any one or a combination of the above items.

COMPARISON TO EMPLOYMENT SECURITY DEPARTMENT FORECAST ON OCCUPATIONAL TRENDS

The Employment Security Department Forecast is another major source of manpower information for planning purposes. This forecast is essentially based on the same sources and major information used to produce to the Job Opportunities Forecast. Generally speaking the Employment Security Forecast groups occupational categories to support general labor market and employment informational requirements. The Job Opportunities Forecast represents a different breakdown of job groupings. These are related to the occupational education programs that will train people for these jobs. Both forecasts have merit and benefit to users. The Employment Security Forecast is a basis for general employment and labor market information; and, the Job Opportunities Forecast for vocational education program planning. This latter forecast is needed to provide the programs necessary to equip prospective workers with the knowledge and skills training needed for vocational education related job groupings.

Because of the value and additional information contained in the Employment Security Forecast, a complete copy of the latest publication titled, Washington State Occupational Trends 1970-1980, July, 1974, is also included in the Appendix. This information should also be beneficial to vocational education program planners. This information should provide additional insights and prospective on the total state's labor market and employment situation for both vocational education related occupations, as well as, professional occupations.

Office staff members Cathy Harris and Gil Zuerlein. Cathy was the typist for this project.

STATE AND VOCATIONAL EDUCATION RELATED JOB NEEDS AND PROGRAM TRENDS

INTRODUCTION

The Alternatives for Washington[1] report, Volume I, reflected citizen "Concerns About Education and Vocational Training." Five proposals are contained within this report on pages 115 through 123. These proposals relate to a need for increased emphasis on vocational education. This Job Opportunities Forecast relates to the first of the five proposal areas. This first proposal states, "develop an awareness of the evolution of training needs to meet the job markets of the future - improve the vocational education systems capability to anticipate both the kinds and quantities of future labor market requirements."

Part 3 and Part 4 of the Job Opportunities Forecast is in direct response to this proposal. Both parts provide training needs information and an interpretation of significant factors and trends. The purpose for including Part 3 is to provide improved understanding and subsequent use of this information for forecasting and planning of vocational education programs.

LIMITATIONS

This analysis is based solely on gross demand information. As such, it does not include two other major subjects which must also be considered in arriving at final conclusions and ultimate decisions for vocational education forecasting and planning. These two subjects are:

1. Existing supply information and forecasts of people being trained by existing public and private vocational education programs, population and job migration, military releases and industry OJT and/or apprenticeship programs; and,

2. Existing and forecast population information, including the numbers and demographic characteristics of the target population and market groups, related to vocational education programs and services.

These limitations should be kept in mind when analyzing, interpreting and/or using the information contained in the job market analysis for vocational education job training needs.

APPROACH

The approach used in this analysis was to identify and collect the least possible information which could be used as the basis for realistic forecasting and related planning. To accomplish this, seven major key questions were developed. The answers to these questions provide the job market information base. These questions are as follows:

1. What will the employment picture for this State look like seven years from now?

---

[1] Alternatives for Washington - Pathways to Washington 1985, Office of Program Planning and Fiscal Management, Olympia, Washington. May, 1975 (Pages 115 through 123).

2. Which public and private sector economic categories will:

    a. Experience the greatest growth;

    b. Remain relatively stable;

    c. Experience the least growth?

3. How many vocational education related jobs will there be over the forecast period?

4. How are the seven major fields of vocational education affected by the forecast changes in economic categories and related employment opportunities?

5. How do these vocational education related jobs relate to the existing vocational education programs?

6. Which of the vocational education programs over this forecast period represent potential:

    a. High growth areas;

    b. Review or reduction areas;

    c. Stable or maintenance level areas?

7. Which of the existing vocational education programs will provide training for:

    a. The greatest number (70 to 80%) of the forecasted job needs for this seven year period;

    b. The least (20 to 30%) of the forecasted job needs for the seven year period;

    c. An extremely limited number of forecast jobs for this seven year period?

This analysis then will deal with each of these questions and provide an interpretation of the facts and trends resulting from the statistical data included in Part 4. The analysis includes three levels which include:

1. JOBS BY STATE ECONOMIC CATEGORIES;

2. JOBS BY VOCATIONAL EDUCATION FIELDS;

3. JOBS BY VOCATIONAL EDUCATION PROGRAMS.

Each level will be addressed separately and is directly related to answering the specific questions related to each of these groupings.

JOBS BY STATE ECONOMIC CATEGORY

The analysis of jobs by economic category provides the information needed to answer questions number 1 and 2:

> "What will the employment picture for this State look like seven years from now?", and
>
> "Which public and private sector economic categories will:
>
> a. Experience the greatest growth;
>
> b. Remain relatively stable;
>
> c. Experience the least growth.

To begin, Table No. 1 (on the following page) is a copy of the Washington State Economic Employment Forecast. This forecast is produced for the governor by the Washington State Department of Revenue. This forecast projects total employment from 1975 through 1982, based on planned industrial and service expansions for the State's 27 major economic forecast categories.

Therefore, this forecast statistically paints a picture of: (1) What business, industry and government will look like for Washington for each year over the next seven years; and, (2) What the employment situation for this State will look like in the same period of time.

In analyzing this forecast, three major employment patterns can be determined. These are: (1) Greatest growth; (2) Maintained growth; and, (3) Reduced or minimum growth. This information can be used as gross indicators for determining major concentrations of job needs. This also provides some meaningful directions for vocational education program planning and development to meet areas of greatest need.

In reviewing Table No. 1, the economic categories reflecting the greatest job growth over the seven year period are (in order of greatest growth):

1. Service
2. Retail
3. Wholesale
4. Finance, Insurance, and Real Estate
5. Self-Employment.

These five economic categories represent 76.1% (or 184,000 of the 241,800 jobs forecast from industry and service expansions) over this seven year period. The remaining 22 economic categories represent only 23.9% of the anticipated expansion and employment requirements during this forecast period.

The statistics indicate the high degree of growth in the service-oriented industries. This also reflects a shifting work pattern and related work ethic. This pattern has been conceptualized and identified as the trends and characteristics associated with a "post-industrial society." This is consistent to the trends and information contained throughout the Alternatives for Washington report.

State of Washington
EMPLOYMENT FORECAST - BY ECONOMIC CLASSIFICATION CATEGORIES

TABLE NO 1

-1- FISCAL YEARS	-2- 1975		-3- 1976		-4- 1977		-5- 1978		-6- 1979		-7- 1980		-8- 1981		-9- 1982	-10- Net Chg. In Jobs by ECC (1975 to 1982)	-11- Total % Job Chg. In Each ECC (1975 to 1982)	-12- ECC Industry Growth Ranking	-13- ECC % Chg. To Total No Jobs (1975 to 1982)	-14- ECC Job Growth Ran
Private																				
Agriculture	32200	-900	31300	-600	30700	-300	30400	-300	30100	-200	29900	300	29600	200	29400	-2800	- 8.69	27	- 1.16	27
Food, Kind	28400	300	28700	400	29100	400	29500	300	29800	200	30000	200	30200	200	30400	2000	7.04	30	.82	18
Textile	7100	300	7400	200	7600	200	7800	200	8000	200	8200	100	8300	200	8500	1400	19.72	8	.57	21
Print, Pub	11500	300	11800	300	12100	300	12400	300	12700	300	13000	300	13300	300	13600	2100	18.26	10	.86	17
Lumb, Wood	46300	-400	45900	2500	48400	800	49200	300	49500	0	49500	200	49700	400	50100	3800	8.21	18	1.57	13
Pulp, Papr	17800	100	17900	100	18000	100	18100	0	18100	0	18100	0	18100	200	18300	500	2.81	25	.20	24
Chemicals	6100	200	6300	100	6400	100	6500	100	6600	100	6700	200	6900	400	7300	1200	19.67	9	.50	22
Petroleum	1900	100	2000	0	2000	0	2000	0	2000	0	2000	0	2000	100	2100	200	10.52	16	.10	25
N-Fer Mat	12100	300	12400	300	12700	200	12900	300	13100	300	13400	400	13800	500	14300	2200	18.18	11	.91	16
Fb-Fab Mat	12300	700	13000	1000	14000	800	14800	700	15500	700	16200	600	16800	600	17400	5100	41.46	* 2	2.11	10
Machinery	12900	600	13500	1000	14500	900	15400	700	16200	800	17000	700	17700	600	18300	5400	4.86	22	2.23	8
Electrical	7300	600	7900	700	8600	700	9300	700	10000	1000	11000	900	11900	700	12600	5300	76.60	* 1	2.19	9
Aerospace	54700	600	55300	200	55500	200	55700	200	55900	100	56000	400	56400	200	56600	1900	3.47	23	.79	19
Shipbuild	8900	400	9300	100	9400	100	9500	100	9600	100	9700	100	9800	300	10100	1200	13.48	13	.50	23
Other Tran	5600	500	6100	300	6400	300	6700	200	6900	200	7100	200	7300	200	7500	1900	33.93	* 4	.79	20
Other Mfrg	17700	300	18000	300	18300	300	18600	400	19000	400	19400	400	19800	600	20400	2700	15.25	12	1.12	15
Mining	1900	0	1900	0	1900	0	1900	0	1900	0	1900	0	1900	0	1900	0	0	26	0	26
Construct	52800	2000	54800	2400	57200	900	58100	100	58000	0	58000	100	58100	400	58500	5700	10.80	15	2.36	7
Tran Serv	50300	1100	51400	800	52200	700	52900	600	53500	400	53900	400	54300	300	54600	4300	8.55	17	1.78	12
Comm, Util	24900	800	25700	600	26300	700	27000	500	27500	200	27700	200	27900	200	28100	3200	12.85	14	1.32	14
Wholesale	71800	1600	73400	1800	75200	2900	78100	2900	81000	2100	83100	2100	85200	2200	87400	15600	21.73	* 6	6.45	** 3
Retail	201100	6700	207800	8100	215900	10200	226100	10900	237000	11300	248300	10300	258600	9300	267900	66800	33.22	* 5	27.63	** 2
Fin-Ins-Re	65700	1200	66900	1500	68400	1900	70300	2200	72500	2400	74900	2500	77400	2400	79800	14100	21.46	* 7	5.83	** 4
Service	207300	7800	215100	9900	225000	11800	236800	12800	249600	12700	262300	12500	274800	11200	286000	78700	37.96	* 3	32.55	** 1
Government																				
Federal	62400	600	63000	500	63500	100	63600	300	63900	100	64000	1300	65300	1600	66900	4500	7.21	19	1.86	11
State, Loc	209100	1500	210600	300	210900	1200	212100	1200	213300	600	213900	600	214500	600	215100	6000	2.87	24	2.48	6
Self-Empl																				
Self-Empl	159300	1100	160400	2200	162600	1200	163800	1300	165100	1200	166300	1300	167600	500	168100	8800	5.52	21	3.64	** 5
Total																				
Total Jobs	1389400		1417800		1452800		1489500		1526300		561500		1597200		1631200					
Total Job Increase/Year		28400		35000		36700		36800		35200		35700		34000		241800	17.40		100.00	
Total Jobs-Industry Expansion																				

SOURCE: State of Washington
Department of Revenue

Employment Forecast by Industry - State of Washington,
January, 1975

* 20% or more job expansion of the 241800 Jo
**76.1% (or 18400 of the 241800 jobs) of the
jobs from industry expansion

A greater orientation of the private sector to providing services results in a shift away from the traditional product orientation. This shift should have a significant effect on forecasting and planning new vocational education programs.

The major economic categories in Table No. 1 showing the least job growth during the forecast period (in order of least growth - 200 or less net increase in employment per year) are:

1. Agriculture
2. Mining
3. Petroleum
4. Pulp and Paper
5. Shipbuilding
6. Chemicals
7. Textiles.

Table No. 1 also includes the level of employment for each forecast economic category for each of the seven years (columns 1 through 9). The yearly job growth or decline is reflected by the numbers inserted between the figures for each year. The total increase in each category is also stated in column 10. The percent of change in employment represents net job increase by economic category over the base year of 1975 (column 11). The seven economic categories reflecting the greatest increased percentage (over 20% increase) in employment level between 1975 and 1982 in order of highest percentage (column 12), are:

1. Electrical
2. Ferrous - Fabricated Metals
3. Service
4. Other Transportation
5. Retail
6. Wholesale
7. Finance, Insurance and Real Estate.

The possibility of developing new programs to support emerging training requirements for these levels and types of employment are indicated.

This analysis, thus far, has considered the total 241,800 forecasted jobs resulting from planned industry and service expansions forecasted for the State. This does not include additional jobs resulting from the replacement factors of people leaving the labor force. The additional replacement jobs as they affect vocational education related job openings are included and detailed in the following section of this job analysis.

JOBS BY VOCATIONAL EDUCATION FIELDS

This analysis of jobs by the seven major vocational education fields provides the information needed to answer questions number 3 and 4:

> "How many vocational education related jobs will there be over the forecast period?", and,

> "How are the seven major vocational education fields affected by the forecast changes in economic categories and related employment opportunities?"

Table No. 2 (on the following page) shows: (1) There will be 509,459 job openings for vocational education related jobs over the forecast period; and, (2) The summary of all the individual O.E. programs contained in Part 4 of this document. The 509,459 jobs include: (1) 199,973 jobs from the forecasted industry and service expansions (or 82.6% of the previously stated total of 241,800 expansion jobs); and, (2) 309,686 jobs from replacement requirements caused by people leaving the work force. The total number of jobs are then broken down into the seven major vocational education fields.

State of Washington
JOB OPPORTUNITIES FORECAST - SUMMARY
-Vocational Education Related Occupations-

TABLE NO. 2

-1-	-2- Expansion Jobs	-3- Replacement Jobs	-4- Total Jobs	-5- % of Total Jobs	-6- 1975 Base Year Employment Level	-7- 1982 End Year Employment Level	-8- Net Increase In Expansion Jobs	-9- % Increase In Jobs By Vocational Education Category
Total Statewide Vocational Education	199,773 (39.2%)	309,686 → (60.8%)	509,459 (100.0%)	100.0	1,070,695	1,270,468	199,773	18.7
Fields:								
Agriculture Occupations	7,001 (20.9%)	* 26,568 → (79.1%)	33,569 (100.0%)	6.6	108,142	115,143	7,001	6.5
Distributive Education Occupations	50,930 (44.6%)	63,102 → (55.4%)	114,032 (100.0%)	** 22.4	225,857	276,787	50,930	*** 22.5
Health Occupations	19,156 (38.3%)	* 30,844 → (61.7%)	50,000 (100.0%)	9.8	65,189	84,345	19,156	*** 29.4
Home and Family Life Occupations	4,194 (32.1%)	* 8,874 → (67.9%)	13,068 (100.0%)	2.6	20,372	24,566	4,194	*** 20.6
Business and Office Occupations	47,817 (35.2%)	* 88,045 → (64.8%)	135,862 (100.0%)	** 26.7	257,809	305,626	47,817	18.5
Technical Occupations	9,805 (41.7%)	14,028 → (48.9%)	23,833 (100.0%)	4.7	59,262	69,067	9,805	16.5
Trade and Industrial Occupations	60,870 (43.3%)	78,225 → (56.2%)	139,095 (100.0%)	** 27.3	334,064	394,934	60,870	18.2

Source: State of Washington
Commission for Vocational Education
Second Edition - Job Opportunities Forecast,
July, 1975

*These 4 fields reflect significant replacement levels of over 60%

**These 3 fields represent 76.4% of all expansion jobs -high growth fields for industry expansion

***These 3 fields represent a 20% or more increase in the number of jobs between 1975 and 1982

Column 1 shows the specific vocational field; Columns 2, 3 and 4 indicate the total number of jobs that will be available in the seven year period. Column 5 gives a related percentage of jobs for each field to the total number of vocational related job openings. Column 6 and 7 show the employment levels for the 1975 base year and 1982 end year, respectively. Column 8 indicates the net increase in jobs between the base and ending year. Finally, column 9 shows the percent of increase in job growth forecast for each vocational education field between 1975 and 1982.

In analyzing Table No. 2, 309,686 or 60.8% of the jobs will be due to replacement requirements from persons leaving the work force. 199,773 or 39.2% of the jobs will be caused by forecasted industry and service expansions. Also, the greatest number of jobs are in Trade and Industrial Occupations - 139,095 jobs or 27.3%. Business and Office Occupations are next with 135,862 jobs or 26.7%. Distributive Education Occupations jobs are the third highest - 114,032 jobs or 22.3%. These three fields represent 76.3% of all jobs for vocational education programs over the forecast seven year period.

The vocational fields with the most rapid rate of job growth during 1975 to 1982, within its own vocational field, are shown in column 9. Health Occupations reflect a 29.4% proportional increase, followed by Distributive Education Occupations with 22.5%, and then with Business and Office Occupations for 20.6%. These indicators of 20% or more change in employment, indicate the areas of highest potential need for emerging programs for the new and changing jobs that will be occurring over this time period.

The replacement statistics (column no. 3) indicate the vocational program with the highest percentage of replacement is in Agricultural Occupations (79.1%), followed by Home and Family Life (67.9%), then Business and Office Occupations (64.8%) and finally Health Occupations (61.7%). Therefore, there is a trend in the vocational education programs within these fields for a substantial maintenance effort on existing programs to train workers in these fields. Reviewing the expansion column (column no. 2), also indicates that the greatest areas of expansion are in the Distributive Education field (44.6%) and the area of least expansion is in Agricultural Occupations (20.9%).

JOBS BY VOCATIONAL EDUCATION PROGRAM

The next step in the analysis further breaks down the seven major fields into their respective vocational education program categories. This analysis provides information to answer questions 5, 6 and 7:

> "How do these vocational education related jobs relate to existing vocational education programs?"
>
> "Which of the vocational education programs over this forecast period represent potential:
>
> a. High growth areas:
>
> b. Review or reduction areas;
>
> c. Stable or maintenance areas?"

"Which of the existing vocational education programs will provide training for:

a. The greatest number (70 to 80%) of forecasted job needs for this seven year period;
b. The least number (20 to 30%) of the forecasted job needs for the seven year period; and,
c. An extremely limited number of forecasted jobs for this seven year period? "

The specific programs within each of the seven vocational education fields will be analyzed in the order presented in Table No. 2. Details of each program are contained in Part 4 of this document.

Agriculture Occupations

In the agriculture occupations field, there are 11 vocational education programs. Of the total 33,569 agricultural jobs previously indicated in Table No. 2, three programs reflect the greatest demand and will provide training for 82.2% of this need. These are as follows:

O.E. Program	Title	Demand
01.01.00	Agricultural Production	8,231
01.02.00	Agricultural Business	16,705
01.03.01	Agricultural Mechanics	2,655
		27,591

The other eight programs will provide training for the remaining 5,978 jobs. Five of these programs will either remain stable or decline during the forecast period (reference Part 4). The remaining three agricultural programs showing the least growth (50 or less jobs per year) and/or possible decline over the forecast period are as follows:

O.E. Program	Title	Demand
01.02.99	Farrier	155
01.03.04	Irrigation Technician	174
01.06.04	Fish and Game Management	282
		611

Although agriculture as an industry is not expected to grow significantly, there will be a need for replacement workers.

Distributive Education Occupations

In the Distributive Education field, there are 18 major vocational education programs. Of the total 114,032 jobs previously indicated in Table No. 2, seven programs reflect the greatest demand and will provide training for 72.2% of the total need. These programs are as follows:

O.E. Program	Title	Demand
04.02.00	Fashion Merchandising	13,617
04.03.00	Parts Merchandising	5,583
04.06.00	Cashier-Checker	11,700
04.06.98	Supermarket Management	8,615
04.08.00	Marketing and Sales	30,819
04.17.00	Real Estate	7,218
04.99.00	Purchasing Management	4,763
		82,315

The other eleven programs in this category will provide training for 27.8% of the need or 31,717 jobs. Seven of these programs will remain relatively stable during the forecast (reference Part 4). The remaining four programs within the Distributive Education field showing the least growth (200 or less jobs per year) over the forecast period are as follows:

O.E. Program	Title	Demand
04.01.00	Advertising Services/ Display Designer	823
04.13.00	Insurance Management	1,564
04.18.00	Commercial Recreation and Tourism	1,056
04.19.98	Flight Attendant	1,171
		4,614

Health Occupations

In the Health Occupations field, there are 28 major vocational education programs. Of the total 50,000 jobs previously indicated in Table No. 2, six programs reflect the greatest demand and will provide training for 77% of the total need in this field. These programs are:

O.E. Program	Title	Demand
07.01.01	Dental Assisting	4,180
07.03.01	Registered/Associate Degree Nursing	13,598
07.03.02	Practical Nursing	5,022
07.03.03	Nurses Aide	5,759
07.03.07	Home Health Aide	4,518
07.03.99	Gerontology Aide	5,423
		38,500

The 22 other Health Occupations programs will provide training for the remaining 23% of the need or 11,500 jobs. Seventeen of these programs will remain relatively stable and/or experience limited growth during the forecast period (reference Part 4). The remaining five programs showing the least growth are:

O.E. Program	Title	Demand
07.04.01	Occupational Therapy Assistant	162
07.04.02	Physical Therapy Assistant	183
07.07.00	Environmental Technician	110
07.08.01	Mental Health Technician	177
07.09.12	Medical Illustrator	121
		753

Home and Family Life Occupations

The Home and Family Life Occupations field contains five major vocational education programs. It should be noted however that additional programs for Home and Family Life Education are also referenced to and included in the section for Trade and Industrial Education programs. Of the total 13,068 jobs previously indicated in Table No. 2, two programs reflect the greatest demand and will provide training for 74.2% of the total need for Home and Family Life Occupations or 9,695 jobs. These programs are:

O.E. Program	Title	Demand
09.02.01	Care and Guidance of Children	7,600
09.02.98	Human Service	2,095
		9,695

The remaining three programs in this category (reference Part 4) will provide training for the remaining 25.8% of the need or 3,373 jobs. These are programs which will remain relatively stable during the forecast period and show a moderate growth of 600 or more jobs over the forecast period.

Business and Office Occupations

In Business and Office Occupations, there are 23 major vocational education programs. Of the total 135,862 jobs previously indicated in Table No. 2, eight programs reflect the greatest demand and will provide training for 77.8% of the total need for this field or 105,738 jobs. These programs are:

O.E. Program	Title	Demand
14.01.00	Business Technology	19,403
14.02.01	Accountant	18,963
14.07.00	Secretarial	29,971
14.05.04	Stock and Inventory Clerk	9,601
14.07.03	Stenographer	6,828
14.07.95	Insurance Secretary	8,312
14.07.96	Real Estate Secretary	6,189
14.08.05	Office/Business Manager	6,422
		105,738

The other 15 programs in this category will provide training for 22.2% of the need or 30,124 jobs. Eleven of these programs will be showing moderate growth during the forecast period (reference Part 4). The remaining four programs showing the least growth (50 or less jobs per year) are:

O.E. Program	Title	Demand
14.03.01	Duplicating Machine Operator	313
14.04.96	Community Planner	55
14.07.02	Medical Secretary	377
14.07.97	Medical Transcriber	297
		1,042

Technical Occupations

In the Technical Occupations field there are 25 major technical education programs. Of the total 23,833 jobs previously indicated in Table No. 2, four programs reflect the greatest demand and will provide training for 78.7% of the total need or for 18,736 jobs. These programs are:

O.E. Program	Title	Demand
16.01.07	Electrical Power Technology	1,349
16.01.08	Electronic Technology	1,605
16.02.03	Food Processing Technology	5,052
16.05.98	Executive Housekeeper	10,730
		18,736

The other 21 technical education programs will provide training for the balance of 21.3% of the need or 5,097 jobs. Twelve of these programs will remain relatively stable (reference Part 4). The remaining nine programs within this category, showing the least growth (approximately 20 or less jobs per year) are:

O.E. Program	Title	Demand
16.01.03	Construction Technician	110
16.01.09	Electromechanical Technology	111
16.01.10	Environmental Control Technician	130
16.01.11	Industrial Technology	33
16.01.15	Nuclear Technology	130
16.01.16	Natural Gas and Petroleum	79
16.01.96	Biomedical Equipment Maintenance and Repair	69
16.06.03	Forestry Technician	92
16.06.98	Diving Technician	110
		864

Due to the forecast system being based on 1970 census information, it is a generally accepted principle that technical occupations are significantly understated. This area in the forecast needs additional refinement and improvement. The increasing number of technicians and/or para-professionals that have been emerging into the labor market since 1970 indicates updated employment ratios are needed to improve both the coverage and overall accuracy of this total field.

Trade and Industrial Occupations

In the Trade and Industrial field there are 58 major vocational education programs. Of the total 139,095 jobs previously indicated in Table No. 2, 11 programs reflect the greatest demand and will provide training for 74%, or 102,898 jobs. These programs are:

O.E. Program	Title	Demand
17.03.02	Automotive Mechanic	5,901
17.03.99	Commercial Driver	10,497
17.10.01	Carpentry	6,016
17.11.00	Custodial Services	10,808
17.12.00	Diesel and Heavy Equipment	4,266
17.16.01	Drycleaning	3,321
17.23.02	Machine Shop	10,864
17.23.06	Welding	3,561
17.26.02	Cosmetology	7,644
17.29.02	Commercial Cooking and Food Management	17,758
17.29.04	Waiter/Waitress	22,502
		102,898

The other 47 programs in this category will provide training for the remaining 26% of the need or 36,197 jobs. Thirty-five of these programs will remain relatively stable and/or show a moderate increase during the forecast period (reference Part 4). The remaining twelve programs showing the least growth over the forecast period (approximately 20 or less jobs per year) are:

O.E. Program	Title	Demand
17.04.03	Air Traffic Control	132
17.07.03	Product/Package Design Technician	62
17.08.00	Commercial Fishing	33
17.10.97	Concrete Technicians	145
17.15.02	Audiovisual Equipment Repair	154
17.20.03	Industrial Radiology	132
17.21.00	Instrument Maintenance and Production	163
17.21.02	Instrument and Watch Repair	163
17.22.00	Marine Engineer	130
17.27.00	Thermoplastic Welding and Bonding	35
17.37.02	Waste and Waste Water Operation	96
17.99.02	Musical Instrument Service and Repair	93
		1,338

Section I

VOCATIONAL EDUCATION PROGRAMS CURRENTLY OFFERED THROUGHOUT THE STATE OF WASHINGTON

SECTION I

Agriculture Occupations

SECTION 1
AGRICULTURE OCCUPATIONS
Field: 01.00.00

Date July, 1975

Page 1 of 2

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
01.01.00	Agriculture Production	.0370	Total Demand	931	1,184	1,212	1,225	1,258	1,231	1,190
			Expansion	-268	-14	13	25	55	27	-13
			Replacement	1,199	1,198	1,199	1,200	1,203	1,204	1,203
			Employment	32,409	32,395	32,408	32,433	32,488	32,515	32,502
01.02.00	Agricultural Business	.0344	Total Demand	2,014	2,339	2,465	2,486	2,476	2,471	2,454
			Expansion	390	692	791	785	749	719	679
			Replacement	1,624	1,647	1,674	1,701	1,727	1,752	1,775
			Employment	47,169	47,861	48,652	49,437	50,186	50,905	51,584
01.02.98	Animal Technician (Based on the number of veterinarians per the 1970 Census)	.0323	Total Demand	53	63	64	67	67	67	65
			Expansion	1	10	11	13	13	13	11
			Replacement	52	53	53	54	54	54	54
			Employment	1,617	1,627	1,638	1,651	1,664	1,677	1,688
01.02.99	Farrier	.0323	Total Demand	22	22	22	22	21	23	23
			Expansion	6	6	6	6	5	7	7
			Replacement	16	16	16	16	16	16	16
			Employment	472	478	484	490	495	502	509
01.03.01	Agricultural Mechanics	.0384	Total Demand	342	398	380	388	388	392	367
			Expansion	41	94	73	78	75	76	49
			Replacement	301	304	307	310	313	316	318
			Employment	7,824	7,918	7,991	8,069	8,144	8,220	8,269
01.03.04	Irrigation Technician	.0196	Total Demand	23	28	24	24	24	24	27
			Expansion	8	13	9	8	8	8	11
			Replacement	15	15	15	16	16	16	16
			Employment	785	798	807	815	823	831	842
01.05.00	Environmental Horticulture	.0375	Total Demand	216	242	262	274	273	276	272
			Expansion	50	73	90	98	94	93	86
			Replacement	166	169	172	176	179	183	186
			Employment	4,425	4,498	4,588	4,686	4,780	4,873	4,959
01.06.00	Agricultural/Natural Resources	.0348	Total Demand	132	154	161	164	164	168	165
			Expansion	25	45	51	52	51	53	49
			Replacement	107	109	110	112	113	115	116
			Employment	3,059	3,104	3,155	3,207	3,258	3,311	3,360
01.06.02	Recreation Technician	.0223	Total Demand	27	32	32	37	35	37	37
			Expansion	11	15	15	19	16	18	18
			Replacement	16	17	17	18	19	19	19
			Employment	756	771	786	805	821	839	857

SECTION 1
AGRICULTURE OCCUPATIONS
Field: 01.00.00

Page 2 of 2

Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
01.06.04	Fish and Game Management	.0285	Total Demand	33	41	39	41	40	44	44
			Expansion	-1	7	5	7	5	9	9
			Replacement	34	34	34	34	35	35	35
			Employment	1,196	1,203	1,208	1,215	1,220	1,229	1,238
01.07.00	Industrial Forestry/Also see 16.06.03 Forestry Technician	.0175	Total Demand	106	535	288	221	175	206	230
			Expansion	-46	377	128	59	13	44	67
			Replacement	152	158	160	162	162	162	163
			Employment	8,647	9,024	9,152	9,211	9,224	9,268	9,335
01.00.00	Agriculture Occupations		Total Demand	3,899	5,038	4,949	4,949	4,921	4,939	4,874
	--- FIELD TOTAL ---		Expansion	217	1,318	1,192	1,150	1,084	1,067	973
			Replacement	3,682	3,720	3,757	3,799	3,837	3,872	3,901
			Employment	108,359	109,677	110,869	112,019	113,103	114,170	115,143

SECTION I

Distributive Education Occupations

Page 1 of 3

SECTION 1
DISTRIBUTIVE EDUCATION OCCUPATIONS
Field: 04.00.00

Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
04.01.00	Advertising Services/Display Designer	.0382	Total Demand	99	110	118	123	126	125	122
			Expansion	41	50	56	58	59	56	51
			Replacement	58	60	62	65	67	69	71
			Employment	1,529	1,579	1,635	1,693	1,752	1,808	1,859
04.02.00	Fashion Merchandising	.0474	Total Demand	1,893	2,070	2,312	2,427	2,479	2,457	2,406
			Expansion	709	846	1,039	1,101	1,101	1,030	935
			Replacement	1,184	1,224	1,273	1,326	1,378	1,427	1,471
			Employment	24,967	25,813	26,852	27,953	29,054	30,084	31,019
4.03.00	Parts Merchandising	.0279	Total Demand	665	713	865	886	809	820	825
			Expansion	293	332	470	477	389	390	385
			Replacement	372	381	395	409	420	430	440
			Employment	13,367	13,699	14,169	14,646	15,035	15,425	15,810
04.04.00	Financial Management	.0412	Total Demand	463	500	553	587	609	626	623
			Expansion	152	182	226	249	260	266	253
			Replacement	311	318	327	338	349	360	370
			Employment	7,553	7,735	7,961	8,210	8,470	8,736	8,989
04.06.00	Cashier-Checker	.0486	Total Demand	1,344	1,486	1,678	1,773	1,843	1,810	1,766
			Expansion	518	629	783	837	865	793	715
			Replacement	826	857	895	936	978	1,017	1,051
			Employment	17,010	17,639	18,422	19,259	20,124	20,917	21,632
04.06.98	Supermarket Management	.0302	Total Demand	1,069	1,211	1,253	1,279	1,287	1,281	1,235
			Expansion	443	569	592	600	590	567	506
			Replacement	626	642	661	679	697	714	729
			Employment	20,751	21,320	21,912	22,512	23,102	23,669	24,175
04.07.00	Club and Tavern Management	.0342	Total Demand	348	394	429	450	465	455	433
			Expansion	143	183	210	224	231	214	185
			Replacement	205	211	219	226	234	241	248
			Employment	6,001	6,184	6,394	6,618	6,849	7,063	7,248
04.08.00	Marketing and Sales	.0366	Total Demand	3,702	4,121	4,479	4,632	4,689	4,648	4,548
			Expansion	1,518	1,869	2,149	2,220	2,198	2,081	1,910
			Replacement	2,184	2,252	2,330	2,412	2,491	2,567	2,638
			Employment	59,716	61,585	63,734	65,954	68,152	70,233	72,143
04.10.00	Interior Merchandising	.0354	Total Demand	332	367	399	414	418	418	405
			Expansion	143	171	197	205	202	194	175
			Replacement	189	196	202	209	216	224	230
			Employment	5,344	5,515	5,712	5,917	6,119	6,313	6,488

SECTION 1
DISTRIBUTIVE EDUCATION OCCUPATIONS
Field: 04.00.00

Date July, 1975

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OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
04.11.00	Hotel, Motel, Restaurant Management	.0425	Total Demand	428	467	496	519	522	529	514
			Expansion	132	164	186	199	194	193	171
			Replacement	296	303	310	320	328	336	343
			Employment	6,962	7,126	7,312	7,511	7,705	7,898	8,069
04.13.00	Insurance Management	.0266	Total Demand	173	194	214	232	246	255	250
			Expansion	66	85	102	117	127	133	125
			Replacement	107	109	112	115	119	122	125
			Employment	4,004	4,089	4,191	4,308	4,435	4,568	4,693
04.16.00	Service Station Attendant	.0110	Total Demand	526	615	724	767	786	746	696
			Expansion	382	466	568	604	616	570	515
			Replacement	144	149	156	163	170	176	181
			Employment	13,047	13,513	14,081	14,685	15,301	15,871	16,386
04.17.00	Real Estate	.0407	Total Demand	854	939	992	1,059	1,106	1,144	1,124
			Expansion	227	300	340	390	420	440	404
			Replacement	627	639	652	669	686	704	720
			Employment	15,395	15,695	16,035	16,425	16,845	17,285	17,689
04.18.00	Commercial Recreation and Tourism	.0374	Total Demand	145	146	152	156	152	155	150
			Expansion	54	53	57	59	53	54	48
			Replacement	91	93	95	97	99	101	102
			Employment	2,415	2,468	2,525	2,584	2,637	2,691	2,739
04.19.00	Transportation	.0209	Total Demand	553	561	619	621	578	583	571
			Expansion	272	274	325	320	271	271	254
			Replacement	281	287	294	301	307	312	317
			Employment	13,473	13,747	14,072	14,392	14,663	14,934	15,188
04.19.98	Flight Attendant	.0912	Total Demand	175	170	168	168	162	165	163
			Expansion	33	26	22	20	13	14	11
			Replacement	142	144	146	148	149	151	152
			Employment	1,560	1,586	1,608	1,628	1,641	1,655	1,666
04.20.00	Service Representative	.0350	Total Demand	358	359	382	376	361	367	364
			Expansion	153	149	167	154	135	136	129
			Replacement	205	210	215	222	226	231	235
			Employment	5,849	5,998	6,165	6,319	6,454	6,590	6,719
04.99.00	Purchasing Management	.0286	Total Demand	613	685	691	695	693	700	686
			Expansion	256	319	317	312	301	299	278
			Replacement	357	366	374	383	392	401	408
			Employment	12,449	12,768	13,085	13,397	13,698	13,997	14,275

SECTION 1
DISTRIBUTIVE EDUCATION OCCUPATIONS
Field: 04.00.00

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
04.00.00	Distributive Education Occupations --- FIELD TOTAL ---		Total Demand	13,740	15,108	16,524	17,164	17,331	17,284	16,881
			Expansion	5,535	6,667	7,806	8,146	8,025	7,701	7,050
			Replacement	8,205	8,441	8,718	9,018	9,306	9,583	9,831
			Employment	231,392	238,059	245,865	254,011	262,036	269,737	276,787

SECTION I

Health Occupations

SECTION 1
HEALTH OCCUPATIONS
FIELD: 07.00.00

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
07.01.01	Dental Assisting	.0728	Total Demand	481	534	589	627	642	658	649
			Expansion	157	196	234	254	250	248	223
			Replacement	324	338	355	373	392	410	426
			Employment	4,450	4,646	4,880	5,134	5,384	5,632	5,855
07.01.02	Dental Hygiene	.0539	Total Demand	37	42	45	48	50	49	51
			Expansion	14	18	20	22	23	21	21
			Replacement	23	24	25	26	27	28	30
			Employment	413	431	451	473	496	517	538
07.01.03	Dental Laboratory Technician	.0308	Total Demand	48	54	60	62	63	65	62
			Expansion	22	28	33	34	34	35	31
			Replacement	26	26	27	28	29	30	31
			Employment	819	847	880	914	948	983	1,014
07.02.00	Medical Laboratory Technology	.0363	Total Demand	51	57	64	67	71	71	68
			Expansion	23	28	34	36	37	36	32
			Replacement	28	29	30	31	34	35	36
			Employment	768	796	830	866	903	939	971
07.03.01	Registered/Associate Degree Nursing	.0554	Total Demand	1,597	1,753	1,930	2,045	2,072	2,120	2,081
			Expansion	551	669	802	869	849	851	769
			Replacement	1,046	1,084	1,128	1,176	1,223	1,269	1,312
			Employment	18,887	19,556	20,358	21,227	22,076	22,927	23,696
07.03.02	Practical Nursing	.0625	Total Demand	599	654	710	752	762	780	765
			Expansion	181	223	262	286	278	280	249
			Replacement	418	431	448	466	484	500	516
			Employment	6,677	6,900	7,162	7,448	7,726	8,006	8,255
07.03.03	Nurses Aide	.0604	Total Demand	675	741	816	865	877	900	885
			Expansion	223	272	327	355	346	348	314
			Replacement	452	469	489	510	531	552	571
			Employment	7,487	7,759	8,086	8,441	8,787	9,135	9,449
07.03.05	Surgical Technician	.0372	Total Demand	41	40	45	48	47	49	51
			Expansion	15	14	18	20	19	20	21
			Replacement	26	26	27	28	28	29	30
			Employment	691	705	723	743	762	782	803
07.03.07	Home Health Aide	.0803	Total Demand	523	580	635	675	694	709	702
			Expansion	156	198	234	254	253	248	222
			Replacement	367	382	401	421	441	461	480
			Employment	4,564	4,762	4,996	5,250	5,503	5,751	5,973

SECTION 1
HEALTH OCCUPATIONS
Field: 07.00.00

Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
07.03.99	Gerontology Aide	.0661	Total Demand	636	699	768	811	827	848	834
			Expansion	199	245	295	317	312	313	280
			Replacement	437	454	473	494	515	535	554
			Employment	6,624	6,869	7,164	7,481	7,793	8,106	8,386
07.04.01	Occupational Therapy Assistant	.0282	Total Demand	18	20	25	25	25	26	23
			Expansion	9	11	15	15	14	15	12
			Replacement	9	9	10	10	11	11	11
			Employment	349	360	375	390	404	419	431
07.04.02	Physical Therapy Assistant	.0430	Total Demand	23	23	26	28	27	28	28
			Expansion	8	8	10	12	10	11	10
			Replacement	15	15	16	16	17	17	18
			Employment	365	373	383	395	405	416	426
07.04.99	Sports Training Assistant	.0587	Total Demand	52	57	63	66	68	68	69
			Expansion	18	22	26	28	28	27	26
			Replacement	34	35	37	38	40	41	43
			Employment	581	603	629	657	685	712	738
07.05.01	Radiologic Technology	.0478	Total Demand	77	87	95	103	104	106	103
			Expansion	29	38	43	48	47	47	42
			Replacement	48	49	52	55	57	59	61
			Employment	1,001	1,039	1,082	1,130	1,177	1,224	1,266
07.05.03	Nuclear Medical Technology	.0477	Total Demand	48	53	59	62	64	65	63
			Expansion	18	22	27	29	29	29	26
			Replacement	30	31	32	33	35	36	37
			Employment	621	643	670	699	728	757	783
07.06.00	Optometric Technician	.0238	Total Demand	27	30	37	37	37	36	37
			Expansion	14	17	23	23	22	21	21
			Replacement	13	13	14	14	15	15	16
			Employment	523	540	563	586	608	629	650
07.07.00	Environmental Technician	.0184	Total Demahd	15	15	17	15	16	16	16
			Expansion	7	7	9	7	8	8	8
			Replacement	8	8	8	8	8	8	8
			Employment	389	396	405	412	420	428	436
07.07.99	Environmental Health, Other See 17.32.02 Waste and Waste Water Operation									

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SECTION 1
HEALTH OCCUPATIONS
Field: 07.00.00

Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
07.08.01	Mental Health Technician	.0662	Total Demand	21	25	25	26	27	27	26
			Expansion	5	8	8	8	9	8	7
			Replacement	16	17	17	18	18	19	19
			Employment	252	260	268	276	285	293	300
07.08.02	Mental Retardation Technician	.0566	Total Demand	122	134	140	148	148	153	148
			Expansion	33	43	47	52	49	51	44
			Replacement	89	91	93	96	99	102	104
			Employment	1,558	1,601	1,648	1,700	1,749	1,800	1,844
07.09.01	EKG-EEG Technician, See 07.99.01 Cardio-Pulmonary Technician									
07.09.03	Respiratory Therapy	.0476	Total Demand	34	35	41	42	44	44	43
			Expansion	13	14	19	19	20	19	17
			Replacement	21	21	22	23	24	25	26
			Employment	432	446	465	484	504	523	540
07.09.04	Medical Assistant	.0673	Total Demand	177	197	217	232	235	242	237
			Expansion	58	73	87	96	93	93	83
			Replacement	119	124	130	136	142	149	154
			Employment	1,768	1,841	1,928	2,024	2,117	2,210	2,293
07.09.05	Central Service Technician	.0367	Total Demand	39	42	48	50	52	51	50
			Expansion	17	19	24	25	26	25	23
			Replacement	22	23	24	25	26	26	27
			Employment	610	629	653	678	704	729	752
07.09.07	Medic I/Medical Emergency Technician	.0637	Total Demand	55	61	67	71	72	74	73
			Expansion	18	22	27	29	28	28	26
			Replacement	37	39	40	42	44	46	47
			Employment	580	602	629	658	686	714	740
07.09.08	Dietetic Technician	.0524	Total Demand	205	219	243	253	257	261	256
			Expansion	64	74	93	99	97	96	87
			Replacement	141	145	150	154	160	165	169
			Employment	2,686	2,760	2,853	2,952	3,049	3,145	3,232
07.09.11	Medical Photographer	.0459	Total Demand	28	32	34	35	35	36	36
			Expansion	10	14	15	15	15	15	14
			Replacement	18	18	19	20	20	21	22
			Employment	385	399	414	429	444	459	473

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SECTION 1
HEALTH OCCUPATIONS
Field: 07.00.00

Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
07.09.12	Medical Illustrator	.0260	Total Demand	16	18	17	18	17	19	16
			Expansion	5	7	6	7	6	7	4
			Replacement	11	11	11	11	11	12	12
			Employment	404	411	417	424	430	437	441
07.99.01	Cardio-Pulmonary Technician	.0582	Total Demand	50	54	62	63	67	66	66
			Expansion	17	20	26	26	28	26	24
			Replacement	33	34	36	37	39	40	42
			Employment	572	592	618	644	672	698	722
07.99.02	Nursing Home Administrator	.0364	Total Demand	174	192	215	226	229	232	223
			Expansion	75	90	109	116	115	114	102
			Replacement	99	102	106	110	114	118	121
			Employment	2,692	2,782	2,891	3,007	3,122	3,236	3,338
07.00.00	Health Occupations --- FIELD TOTAL ---		Total Demand	5,869	6,448	7,093	7,500	7,629	7,799	7,661
			Expansion	1,959	2,400	2,873	3,101	3,045	3,040	2,738
			Replacement	3,910	4,048	4,220	4,399	4,584	4,759	4,923
			Employment	67,148	69,548	72,421	75,522	78,567	81,607	84,345

SECTION I

Home & Family Life Occupations

SECTION 1
HOME AND FAMILY LIFE OCCUPATIONS
Field: 09.00.00

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
09.02.01	Care and Guidance of Children	.0727	Total Demand	904	986	1,074	1,136	1,155	1,181	1,164
			Expansion	256	314	376	407	398	395	352
			Replacement	648	672	698	729	757	786	812
			Employment	8,918	9,232	9,608	10,015	10,413	10,808	11,160
09.02.02	Clothing Management, Production and Service, See 17.33.01 Custom Apparel Design and Construction									
09.02.03	Food Management, Production and Services Management, See 17.29.02 Commercial Cooking and Food Management									
09.02.04	Home Furnishings, Equipment and Services, See 17.07.01, Interior Decoration									
09.02.05	Institution and Home Management and Support Services, See 17.11.00, Custodial Services									
09.02.96	Guidance Assistant	.0445	Total Demand	137	141	154	161	159	161	161
			Expansion	38	40	50	55	51	51	48
			Replacement	99	101	104	106	108	110	113
			Employment	2,223	2,263	2,313	2,368	2,419	2,470	2,518
09.02.97	Alcoholism Counselor	.0403	Total Demand	189	194	210	218	218	224	222
			Expansion	59	62	75	80	76	78	74
			Replacement	130	132	135	138	142	146	148
			Employment	3,226	3,288	3,363	3,443	3,519	3,597	3,671
09.02.98	Human Service	.0450	Total Demand	269	279	300	311	309	315	312
			Expansion	72	79	95	102	95	97	90
			Replacement	197	200	205	209	214	218	222
			Employment	4,384	4,463	4,558	4,660	4,755	4,852	4,942
09.02.99	Social Service	.0391	Total Demand	111	108	118	123	120	123	121
			Expansion	30	26	35	38	33	35	32
			Replacement	81	82	83	85	87	88	89
			Employment	2,076	2,102	2,137	2,175	2,208	2,243	2,275

SECTION 1
HOME AND FAMILY LIFE OCCUPATIONS
Field: 09.00.00

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
09.00.00	Home and Family Life		Total Demand	1,610	1,708	1,856	1,949	1,961	2,004	1,980
	Occupations		Expansion	455	521	631	682	653	656	596
			Replacement	1,155	1,187	1,225	1,267	1,308	1,348	1,384
	--- FIELD TOTAL ---		Employment	20,827	21,348	21,979	22,661	23,314	23,970	24,566

SECTION I

Business & Office Occupations

SECTION 1
BUSINESS AND OFFICE OCCUPATIONS
Field: 14.00.00

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
14.01.00	Business Technology	.0343	Total Demand	2,388	2,637	2,812	2,886	2,863	2,912	2,905
			Expansion	926	1,136	1,267	1,296	1,232	1,238	1,190
			Replacement	1,462	1,501	1,545	1,590	1,631	1,674	1,715
			Employment	42,614	43,750	45,017	46,313	47,545	48,783	49,973
14.01.01	Accountant	.0425	Total Demand	2,347	2,548	2,714	2,800	2,810	2,876	2,868
			Expansion	791	951	1,071	1,110	1,074	1,094	1,041
			Replacement	1,556	1,597	1,643	1,690	1,736	1,782	1,827
			Employment	36,594	37,545	38,616	39,726	40,800	41,894	42,935
14.01.02	Bookkeeper, See 14.01.01, Accountant									
14.01.05	Teller Training	.0624	Total Demand	338	361	393	422	442	460	463
			Expansion	75	92	117	137	147	156	150
			Replacement	263	269	276	285	295	304	313
			Employment	4,229	4,321	4,438	4,575	4,722	4,878	5,028
14.02.00	Data Processing	.0223	Total Demand	678	742	754	764	752	778	761
			Expansion	309	365	370	371	351	369	345
			Replacement	369	377	384	393	401	409	416
			Employment	16,543	16,908	17,278	17,649	18,000	18,369	18,714
14.02.02	Keypunch	.0670	Total Demand	381	396	417	431	431	444	445
			Expansion	87	96	110	115	108	114	108
			Replacement	294	300	307	316	323	330	337
			Employment	4,388	4,484	4,594	4,709	4,817	4,931	5,039
14.03.01	Duplicating Machine Operator	.0576	Total Demand	39	40	44	46	47	48	49
			Expansion	10	10	13	14	14	14	14
			Replacement	29	30	31	32	33	34	35
			Employment	512	522	535	549	563	577	591
14.03.03	General Office Clerks, See Secretarial and Steno. Programs: 14.07.00, 14.07.02, 14.07.03, 14.07.95, 14.07.96, and 14.07.98									
14.03.99	Micrographics	.0519	Total Demand	284	305	328	336	336	342	341
			Expansion	86	102	119	120	114	114	108
			Replacement	198	203	209	216	222	228	233
			Employment	3,814	3,916	4,035	4,155	4,269	4,383	4,491

SECTION 1
BUSINESS AND OFFICE OCCUPATIONS
Field: 14.00.00

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
14.04.06	Receptionist, See Secretarial and Steno. Programs: 14.07.00, 14.07.02, 14.07.03, 14.07.95, 14.07.96, 14.07.98		Total Demand							
			Expansion							
			Replacement							
			Employment							
14.04.96	Community Planner	.0100	Total Demand	8	7	8	8	8	8	8
			Expansion	4	3	4	4	4	4	4
			Replacement	4	4	4	4	4	4	4
			Employment	318	321	325	329	333	337	341
14.04.97	Medical Records	.0672	Total Demand	159	175	193	204	210	214	212
			Expansion	51	63	75	81	81	80	73
			Replacement	108	112	118	123	129	134	139
			Employment	1,606	1,669	1,744	1,825	1,906	1,986	2,059
14.04.98	Library Technician	.0633	Total Demand	451	436	468	475	467	471	473
			Expansion	70	52	79	81	69	69	66
			Replacement	381	384	389	394	398	402	407
			Employment	6,010	6,062	6,141	6,222	6,291	6,360	6,426
14.04.99	Mass Communications	.0290	Total Demand	175	181	190	193	186	189	187
			Expansion	77	80	87	88	78	79	75
			Replacement	98	101	103	105	108	110	112
			Employment	3,394	3,474	3,561	3,649	3,727	3,806	3,881
14.05.04	Stock and Inventory Clerk	.0208	Total Demand	1,129	1,254	1,429	1,475	1,455	1,440	1,419
			Expansion	625	735	892	919	880	848	809
			Replacement	504	519	537	556	575	592	610
			Employment	24,201	24,936	25,828	26,747	27,627	28,475	29,284
14.06.00	Personnel and Labor Relations	.0326	Total Demand	437	439	457	476	459	513	522
			Expansion	136	134	147	161	139	187	190
			Replacement	301	305	310	315	320	326	332
			Employment	9,212	9,346	9,493	9,654	9,793	9,980	10,170
14.07.00	Secretarial	.0625	Total Demand	3,897	4,023	4,267	4,383	4,358	4,508	4,535
			Expansion	945	1,007	1,178	1,218	1,123	1,198	1,153
			Replacement	2,952	3,016	3,089	3,165	3,235	3,310	3,382
			Employment	47,222	48,229	49,407	50,625	51,748	52,946	54,099
14.07.02	Medical Secretary	.0614	Total Demand	43	49	53	56	59	59	58
			Expansion	15	20	22	24	25	24	22
			Replacement	28	29	31	32	34	35	36
			Employment	464	484	506	530	555	579	601

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SECTION 1
BUSINESS AND OFFICE OCCUPATIONS
Field: 14.00.00

Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
14.07.03	Stenographer	.0636	Total Demand	872	911	969	1,000	1,004	1,033	1,039
			Expansion	212	235	276	289	274	285	274
			Replacement	660	676	693	711	730	748	765
			Employment	10,400	10,635	10,911	11,200	11,474	11,759	12,033
14.07.95	Insurance Secretary	.0631	Total Demand	1,033	1,090	1,168	1,219	1,240	1,276	1,286
			Expansion	247	286	342	370	367	379	366
			Replacement	786	804	826	849	873	897	920
			Employment	12,458	12,744	13,086	13,456	13,823	14,202	14,568
14.07.96	Real Estate Secretary	.0634	Total Demand	784	822	878	908	915	938	944
			Expansion	193	218	257	270	260	266	256
			Replacement	591	604	621	638	655	672	688
			Employment	9,323	9,541	9,798	10,068	10,328	10,594	10,850
14.07.97	Medical Transcriber	.0612	Total Demand	35	37	42	43	47	46	47
			Expansion	13	14	18	18	20	18	18
			Replacement	22	23	24	25	27	28	29
			Employment	367	381	399	417	437	455	473
14.07.98	Legal Secretary	.0473	Total Demand	217	228	246	257	257	270	270
			Expansion	67	73	88	95	90	99	94
			Replacement	150	155	158	162	167	171	176
			Employment	3,193	3,266	3,354	3,449	3,539	3,638	3,732
14.07.99	Court Reporter	.0635	Total Demand	401	417	446	460	461	474	475
			Expansion	99	108	130	135	128	132	126
			Replacement	302	309	316	325	333	342	349
			Employment	4,749	4,857	4,987	5,122	5,250	5,382	5,508
14.08.05	Office/Business Manager	.0285	Total Demand	789	889	931	952	955	962	944
			Expansion	334	422	450	458	448	444	413
			Replacement	455	467	481	494	507	518	531
			Employment	15,980	16,402	16,852	17,310	17,758	18,202	18,615
14.08.99	Legal Assistant (Based on the Number of Lawyers per the 1970 Census)	.0262	Total Demand	220	255	242	252	250	257	239
			Expansion	71	104	89	96	92	97	76
			Replacement	149	151	153	156	158	160	163
			Employment	5,661	5,765	5,854	5,950	6,042	6,139	6,215
14.09.01	Clerk Typists, See Secretarial and Steno. Programs: 14.07.00, 14.07.02, 14.07.03, 14.07.95, 14.07.96, 14.07.98									

SECTION 1
BUSINESS AND OFFICE OCCUPATIONS
Field: 14.00.00

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
14.00.00	Business and Office Occupations		Total Demand	17,105	18,242	19,449	20,046	20,012	20,518	20,490
			Expansion	5,443	6,306	7,201	7,470	7,118	7,308	6,971
	--- FIELD TOTAL		Replacement	11,662	11,936	12,248	12,576	12,894	13,210	13,519
			Employment	263,252	269,558	276,759	284,229	291,347	298,655	305,626

SECTION I

Technical Occupations

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SECTION 1
TECHNICAL OCCUPATIONS
Field: 16.00.00

Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
16.01.00	Engineering Technician	.0184	Total Demand	28	29	30	32	29	32	33
			Expansion	14	15	15	17	14	17	17
			Replacement	14	14	15	15	15	15	16
			Employment	779	794	809	826	840	857	874
16.01.03	Construction Technician	.0184	Total Demand	15	15	17	15	16	16	16
			Expansion	7	7	9	7	8	8	8
			Replacement	8	8	8	8	8	8	8
			Employment	389	396	405	412	420	428	436
16.01.05	Chemical Technician	.0216	Total Demand	31	27	28	28	30	31	43
			Expansion	15	11	12	11	12	13	24
			Replacement	16	16	16	17	18	18	19
			Employment	772	783	795	806	818	831	855
16.01.06	Civil Engineering Technician	.0194	Total Demand	47	47	49	48	47	49	49
			Expansion	17	17	18	17	16	18	17
			Replacement	30	30	31	31	31	31	32
			Employment	1,535	1,552	1,570	1,587	1,603	1,621	1,638
16.01.07	Electrical Power Technology Also See 16.01.09 Electromechanical Technology	.0195	Total Demand	217	224	190	168	165	184	201
			Expansion	114	118	82	59	55	73	88
			Replacement	103	106	108	109	110	111	113
			Employment	5,302	5,420	5,502	5,561	5,616	5,689	5,777
16.01.08	Electronic Technology, Also See 16.01.09 Electromechanical Technology	.0168	Total Demand	245	258	227	205	207	226	237
			Expansion	141	152	118	94	95	112	122
			Replacement	104	106	109	111	112	114	115
			Employment	6,210	6,362	6,480	6,574	6,669	6,781	6,903
16.01.09	Electromechanical Technology Also See 16.01.07 Electrical Power Tech. and 16.01.08 Electronic Tech.	.0133	Total Demand	15	16	14	16	16	18	16
			Expansion	9	10	8	9	9	11	9
			Replacement	6	6	6	7	7	7	7
			Employment	441	451	459	468	477	488	497
16.01.10	Environmental Control Technician	.0183	Total Demand	17	16	19	19	19	19	21
			Expansion	9	8	10	10	10	10	11
			Replacement	8	8	9	9	9	9	10
			Employment	482	490	500	510	520	530	541
16.01.11.	Industrial Technology	.0170	Total Demand	4	5	5	5	4	5	5
			Expansion	2	3	2	2	1	2	2
			Replacement	2	2	3	3	3	3	3
			Employment	162	165	167	169	170	172	174

SECTION 1
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OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
16.01.12	Instrumentation Technician, See 17.21.02 Instrument and Watch Repair		Total Demand							
			Expansion							
			Replacement							
			Employment							
16.01.13	Mechanical Engineering Technology (Includes 30% of the Mechanical Engineers from the Census)	.0151	Total Demand	56	58	56	54	52	60	59
			Expansion	32	34	31	29	27	34	33
			Replacement	24	24	25	25	25	26	26
			Employment	1,546	1,580	1,611	1,640	1,667	1,701	1,734
16.01.15	Nuclear Technology	.0183	Total Demand	17	16	19	19	19	19	21
			Expansion	9	8	10	10	10	10	11
			Replacement	8	8	9	9	9	9	10
			Employment	482	490	500	510	520	530	541
16.01.16	Natural Gas and Petroleum Technician	.0208	Total Demand	14	15	11	9	9	10	11
			Expansion	7	8	4	2	2	3	3
			Replacement	7	7	7	7	7	7	8
			Employment	331	339	343	345	347	350	353
16.01.17	Scientific Data Processing See 14.02.00 Data Processing									
16.01.54	Land Survey Technician	.0151	Total Demand	40	41	44	45	43	46	44
			Expansion	21	22	24	25	23	25	23
			Replacement	19	19	20	20	20	21	21
			Employment	1,263	1,285	1,309	1,334	1,357	1,382	1,405
16.01.95	Communications Electronics Also See 16.01.97 Industrial Electronics and 16.01.98 Aviation Electronics	.0170	Total Demand	101	109	113	115	113	120	116
			Expansion	56	63	66	67	64	70	64
			Replacement	45	46	47	48	49	50	52
			Employment	2,666	2,729	2,795	2,862	2,926	2,996	3,060
16.01.96	Biomedical Equipment Maintenance and Repair	.0183	Total Demand	8	11	9	11	9	10	11
			Expansion	3	6	4	6	4	5	6
			Replacement	5	5	5	5	5	5	5
			Employment	240	246	250	256	260	265	271
16.01.97	Industrial Electronics, Also See 16.01.95 Communication Electronics and 16.01.98 Aviation Electronics	.0175	Total Demand	42	43	44	47	44	50	46
			Expansion	23	24	24	27	24	29	25
			Replacement	19	19	20	20	20	21	21
			Employment	1,093	1,117	1,141	1,168	1,192	1,221	1,246
16.01.98	Aviation Electronics, Also See 16.01.95 Communication (continued next page)	.0127	Total Demand	80	64	62	63	56	74	64
			Expansion	41	24	22	23	16	33	24

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OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
16.01.98 (continued)	Electronics and 16.01.97 Industrial Electronics	.0127	Replacement	39	40	40	40	40	41	41
			Employment	3,090	3,114	3,136	3,159	3,175	3,208	3,232
16.01.99	Marine Technology, Also See 16.06.04 Oceanographic/Biology Technician	.0234	Total Demand	38	37	39	39	38	40	39
			Expansion	17	16	17	17	16	17	16
			Replacement	21	21	22	22	22	23	23
			Employment	884	900	917	934	950	967	983
16.02.03	Food Processing Technology	.0441	Total Demand	596	652	727	763	782	776	756
			Expansion	218	261	322	343	346	326	293
			Replacement	378	391	405	420	436	450	463
			Employment	8,598	8,859	9,181	9,524	9,870	10,196	10,489
16.05.98	Executive Housekeeper	.0464	Total Demand	1,320	1,415	1,534	1,601	1,606	1,637	1,617
			Expansion	432	504	595	633	610	611	566
			Replacement	888	911	939	968	996	1,026	1,051
			Employment	19,151	19,655	20,250	20,883	21,493	22,104	22,670
16.06.01	Commercial Pilot	.0100	Total Demand	64	54	52	50	43	46	41
			Expansion	39	29	26	24	17	20	15
			Replacement	25	25	26	26	26	26	26
			Employment	2,419	2,448	2,474	2,498	2,515	2,535	2,550
16.06.03	Forestry Technician, Also See 01.07.00 Industrial Forestry	.0177	Total Demand	12	14	11	12	10	15	18
			Expansion	3	5	2	3	1	6	8
			Replacement	9	9	9	9	9	9	10
			Employment	525	530	532	535	536	542	550
16.06.04	Oceanographic/Biology Technician, Also See 16.01.99 Marine Technology	.0340	Total Demand	22	29	27	27	28	28	26
			Expansion	-2	5	3	3	4	4	2
			Replacement	24	24	24	24	24	24	24
			Employment	696	701	704	707	711	715	717
16.06.98	Diving Technician	.0184	Total Demand	15	15	17	15	16	16	16
			Expansion	7	7	9	7	8	8	8
			Replacement	8	8	8	8	8	8	8
			Employment	389	396	405	412	420	428	436
16.06.99	Sign Language Interpreter	.0405	Total Demand	54	53	58	58	56	58	57
			Expansion	11	9	14	14	11	13	12
			Replacement	43	44	44	44	45	45	45
			Employment	1,062	1,071	1,085	1,099	1,110	1,123	1,135
	(Field Total continued on next page)									

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OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
16.00.00	Technical Occupations		Total Demand	3,098	3,263	3,402	3,464	3,457	3,585	3,564
			Expansion	1,245	1,366	1,447	1,459	1,403	1,478	1,407
	--- FIELD TOTAL ---		Replacement	1,853	1,897	1,955	2,005	2,054	2,107	2,157
			Employment	60,507	61,873	63,320	64,779	66,182	67,660	69,067

SECTION I

Trade & Industrial Occupations

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SECTION 1
TRADE AND INDUSTRIAL OCCUPATIONS
Field: 17.00.00

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OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
17.01.00	Commercial Refrigeration and Air Conditioning Maintenance	.0236	Total Demand	89	98	94	88	89	91	89
			Expansion	45	53	48	41	41	42	39
			Replacement	44	45	46	47	48	49	50
			Employment	1,858	1,911	1,959	2,000	2,041	2,083	2,122
17.02.00	Appliance and Vending Machine Repair	.0189	Total Demand	105	112	124	129	126	125	118
			Expansion	60	66	75	79	74	72	64
			Replacement	45	46	49	50	52	53	54
			Employment	2,414	2,480	2,555	2,634	2,708	2,780	2,844
17.03.01	Auto Body Rebuild	.0114	Total Demand	102	122	139	148	150	148	136
			Expansion	74	93	109	116	117	114	100
			Replacement	28	29	30	32	33	34	36
			Employment	2,509	2,602	2,711	2,827	2,944	3,058	3,158
17.03.02	Automotive Mechanic	.0180	Total Demand	690	797	869	901	906	893	845
			Expansion	400	498	560	582	576	553	496
			Replacement	290	299	309	319	330	340	349
			Employment	16,142	16,640	17,200	17,782	18,358	18,911	19,407
17.03.99	Commercial Driver	.0159	Total Demand	1,392	1,651	1,606	1,543	1,415	1,436	1,454
			Expansion	729	973	914	838	698	709	715
			Replacement	663	678	692	705	717	727	739
			Employment	41,737	42,710	43,624	44,462	45,160	45,869	46,584
17.04.01	Aircraft Mechanics	.0126	Total Demand	147	108	107	109	95	126	111
			Expansion	74	34	33	34	20	51	35
			Replacement	73	75	74	75	75	75	76
			Employment	5,851	5,885	5,918	5,952	5,972	6,023	6,058
17.04.02	Aircraft Operations, See 16.06.01 Commercial Pilot									
17.04.03	Air Traffic Control	.0150	Total Demand	19	17	13	15	12	26	30
			Expansion	8	6	2	4	1	15	18
			Replacement	11	11	11	11	11	11	12
			Employment	750	756	758	762	763	778	796
17.06.00	Office Machine Repair	.0140	Total Demand	48	55	65	68	62	63	61
			Expansion	32	39	48	50	44	44	41
			Replacement	16	16	17	18	18	19	20
			Employment	1,151	1,190	1,238	1,288	1,332	1,376	1,417
17.07.00	Commercial Art	.0327	Total Demand	172	192	200	205	207	209	199
			Expansion	63	81	85	88	87	86	74

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TRADE AND INDUSTRIAL OCCUPATIONS
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OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
17.07.00	Commercial Art (continued)	.0327	Replacement	109	111	115	117	120	123	125
			Employment	3,332	3,413	3,498	3,586	3,673	3,759	3,833
17.07.01	Interior Decoration, Also See 17.10.05 Painting and Decorating	.0308	Total Demand	161	175	156	145	146	151	154
			Expansion	69	80	59	46	46	49	51
			Replacement	92	95	97	99	100	102	103
			Employment	3,007	3,087	3,146	3,192	3,238	3,287	3,338
17.07.03	Product/Package Design Technician	.0259	Total Demand	8	8	9	10	9	8	10
			Expansion	4	4	5	6	5	4	6
			Replacement	4	4	4	4	4	4	4
			Employment	163	167	172	178	183	187	193
17.08.00	Commercial Fishing, Also See 17.08.02 Marine Maintenance and Repair and 17.10.98 Marine Carptentry	.0216	Total Demand	6	3	4	5	4	5	6
			Expansion	3	0	1	2	1	2	3
			Replacement	3	3	3	3	3	3	3
			Employment	119	119	120	122	123	125	128
17.08.02	Marine Maintenance and Repair Also See 17.08.00 Commercial Fishing and 17.10.98 Marine Carpentry	.0213	Total Demand	33	29	29	31	30	33	40
			Expansion	18	14	13	14	13	16	22
			Replacement	15	15	16	17	17	17	18
			Employment	722	736	749	763	776	792	814
17.09.00	Photography, Also See 17.09.99 Photo-Journalism	.0402	Total Demand	52	53	58	59	61	61	61
			Expansion	20	20	24	24	25	25	23
			Replacement	32	33	34	35	36	36	38
			Employment	802	822	846	870	895	920	943
17.09.99	Photo-Journalism, Also See 17.09.00 Photography	.0301	Total Demand	44	46	49	52	51	52	52
			Expansion	19	20	22	24	22	23	22
			Replacement	25	26	27	28	29	29	30
			Employment	863	883	905	929	951	974	996
17.10.00	Building Trades (Secondary) See 17.10.01 Carpentry, 17.10.04 Masonry, 17.10.05 Painting and Decorating, 17.10.08 Drywall Installation, Also See Section Two Programs									
17.10.01	Carpentry	.0238	Total Demand	1,029	1,172	877	697	708	747	786
			Expansion	536	663	360	176	183	216	250
			Replacement	493	509	517	521	525	531	536
			Employment	20,739	21,402	21,762	21,938	22,121	22,337	22,587

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OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
17.10.03	Fluid Power Technician	.0206	Total Demand	286	356	331	312	298	309	327
			Expansion	140	206	177	155	138	146	161
			Replacement	146	150	154	157	160	163	166
			Employment	7,092	7,298	7,475	7,630	7,768	7,914	8,075
17.10.04	Masonry	.0192	Total Demand	109	129	86	60	65	68	74
			Expansion	63	81	37	11	16	19	24
			Replacement	46	48	49	49	49	49	50
			Employment	2,418	2,499	2,536	2,547	2,563	2,582	2,606
17.10.05	Painting and Decorating, Also See 17.07.01 Interior Decoration	.0291	Total Demand	201	215	183	163	164	174	179
			Expansion	88	99	65	44	43	52	55
			Replacement	113	116	118	119	121	122	124
			Employment	3,884	3,983	4,048	4,092	4,135	4,187	4,242
17.10.08	Drywall Installation	.0090	Total Demand	67	80	42	19	21	23	29
			Expansion	52	63	25	2	4	6	12
			Replacement	15	17	17	17	17	17	17
			Employment	1,732	1,795	1,820	1,822	1,826	1,832	1,844
17.10.97	Concrete Technicians	.0224	Total Demand	28	30	20	16	16	17	18
			Expansion	14	16	6	2	2	3	4
			Replacement	14	14	14	14	14	14	14
			Employment	588	604	610	612	614	617	621
17.10.98	Marine Carpentry, Also See 17.08.00 Commercial Fishing and 17.08.02 Marine Maintenance and Repair	.0238	Total Demand	118	81	78	79	76	84	112
			Expansion	66	27	24	24	21	28	55
			Replacement	52	54	54	55	55	56	57
			Employment	2,208	2,235	2,259	2,283	2,304	2,332	2,387
17.10.99	Industrial Maintenance Technician	.0249	Total Demand	186	260	210	190	182	193	217
			Expansion	70	140	88	66	56	66	88
			Replacement	116	120	122	124	126	127	129
			Employment	4,661	4,801	4,889	4,955	5,011	5,077	5,165
17.11.00	Custodial Services	.0460	Total Demand	1,327	1,426	1,546	1,613	1,618	1,649	1,629
			Expansion	438	512	605	643	619	621	575
			Replacement	889	914	941	970	999	1,028	1,054
			Employment	19,347	19,859	20,464	21,107	21,726	22,347	22,922
17.12.00	Diesel and Heavy Equipment	.0178	Total Demand	604	844	636	531	507	545	599
			Expansion	297	527	313	204	178	212	261
			Replacement	307	317	323	327	329	333	338
			Employment	17,320	17,847	18,160	18,364	18,542	18,754	19,015

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OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
17.13.00	Drafting, Also See 17.13.02 Technical Illustration	.0152	Total Demand	125	134	138	139	138	143	139
			Expansion	78	85	88	88	86	89	83
			Replacement	47	49	50	51	52	54	56
			Employment	3,109	3,194	3,282	3,370	3,456	3,545	3,628
17.13.02	Tech Illustration, Also See 17.13.00 Drafting	.0174	Total Demand	102	108	113	113	113	114	114
			Expansion	59	64	68	67	66	66	64
			Replacement	43	44	45	46	47	48	50
			Employment	2,448	2,512	2,580	2,647	2,713	2,779	2,843
17.14.01	Industrial Electricity	.0141	Total Demand	381	366	331	274	241	260	274
			Expansion	247	229	192	133	99	116	129
			Replacement	134	137	139	141	142	144	145
			Employment	9,432	9,661	9,853	9,986	10,085	10,201	10,330
17.15.01	Communications Electronics, See 16.01.95 Communications Electronics, 16.01.97 Aviation Electronics, and 16.01.98 Electronics Technology									
17.15.02	Audiovisual Equipment Repair	.0571	Total Demand	21	21	22	22	22	23	23
			Expansion	4	3	4	4	3	4	4
			Replacement	17	18	18	18	19	19	19
			Employment	313	316	320	324	327	331	335
17.15.03	Radio/TV Repair, See 16.01.08 Electronic Technology									
17.15.98	Biomedical Equipment Maintenance and Repair, See 16.01.96 Biomedical Equipment Maintenance and Repair									
17.15.99	Electronics Occupations, Other See 16.01.08 Electronic Technology									
17.16.01	Drycleaning	.0519	Total Demand	384	429	471	501	508	520	508
			Expansion	142	178	209	227	223	223	201
			Replacement	242	251	262	274	285	297	307
			Employment	4,670	4,848	5,057	5,284	5,507	5,730	5,931

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OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
17.19.00	Graphic Arts/Printing, Also See 17.19.98 Visual Communication and 17.19.99 Media Technician	.0294	Total Demand	257	265	271	275	273	279	282
			Expansion	111	115	118	118	113	116	115
			Replacement	146	150	153	157	160	163	167
			Employment	4,977	5,092	5,210	5,328	5,441	5,557	5,672
17.19.98	Visual Communications, Also See 17.19.00 Graphic Arts/Printing and 17.19.99 Media Technician	.0291	Total Demand	28	29	34	34	34	33	34
			Expansion	14	15	19	19	18	17	17
			Replacement	14	14	15	15	16	16	17
			Employment	465	480	499	518	536	553	570
17.19.99	Media Technician, Also See 17.19.00 Graphic Arts/Printing and 17.19.98 Visual Communications	.0398	Total Demand	40	42	47	48	50	51	49
			Expansion	17	19	23	23	24	24	21
			Replacement	23	23	24	25	26	27	28
			Employment	572	591	614	637	661	685	706
17.20.03	Industrial Radiology	.0479	Total Demand	15	17	18	20	22	20	20
			Expansion	6	7	8	9	11	9	8
			Replacement	9	10	10	11	11	11	12
			Employment	190	197	205	214	225	234	242
17.21.00	Instrument Maintenance and Production, Also See 17.21.02 Instrument and Watch Repair	.0422	Total Demand	20	24	23	24	25	24	23
			Expansion	5	8	7	8	9	7	6
			Replacement	15	16	16	16	16	17	17
			Employment	367	375	382	390	399	406	412
17.21.02	Instrument and Watch Repair, Also See 17.21.00 Instrument Maintenance and Production	.0422	Total Demand	20	24	23	24	25	24	23
			Expansion	5	8	7	8	9	7	6
			Replacement	15	16	16	16	16	17	17
			Employment	367	375	382	390	399	406	412
17.22.00	Marine Engineer	.0210	Total Demand	15	18	19	19	19	20	20
			Expansion	7	10	11	11	11	11	11
			Replacement	8	8	8	8	8	9	9
			Employment	367	377	388	399	410	421	432
17.23.02	Machine Shop	.0224	Total Demand	1,425	1,729	1,570	1,486	1,475	1,537	1,642
			Expansion	688	970	794	694	669	715	802
			Replacement	737	759	776	792	806	822	840
			Employment	32,872	33,842	34,636	35,330	35,999	36,714	37,516
17.23.05	Sheetmetal	.0166	Total Demand	256	274	225	197	196	212	223
			Expansion	165	180	129	99	97	110	119
			Replacement	91	94	96	98	99	102	104
			Employment	5,526	5,706	5,835	5,934	6,031	6,141	6,260

SECTION 1
TRADE AND INDUSTRIAL OCCUPATIONS
Field: 17.00.00

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
17.23.06	Welding	.0197	Total Demand	549	587	513	463	465	474	510
			Expansion	353	383	304	249	246	250	280
			Replacement	196	204	209	214	219	224	230
			Employment	9,942	10,325	10,629	10,878	11,124	11,374	11,654
17.24.00	Materials Testing	.0241	Total Demand	39	39	35	35	32	37	43
			Expansion	19	19	14	14	11	16	20
			Replacement	20	20	21	21	21	21	23
			Employment	840	859	873	887	898	914	934
17.26.01	Barbering	.0431	Total Demand	253	290	288	301	304	310	289
			Expansion	71	103	97	105	104	105	81
			Replacement	182	187	191	196	200	205	208
			Employment	4,230	4,333	4,430	4,535	4,639	4,744	4,825
17.26.02	Cosmetology	.0708	Total Demand	922	1,026	1,080	1,135	1,155	1,179	1,147
			Expansion	237	318	347	376	370	368	314
			Replacement	685	708	733	759	785	811	833
			Employment	9,684	10,002	10,349	10,725	11,095	11,463	11,777
17.27.00	Thermoplastic Welding and Bonding	.0202	Total Demand	5	5	5	5	5	5	5
			Expansion	2	2	2	2	2	2	2
			Replacement	3	3	3	3	3	3	3
			Employment	164	166	168	170	172	174	176
17.28.01	Fire Science/Fireman (Paid)	.0112	Total Demand	82	60	75	75	63	70	72
			Expansion	33	11	26	26	14	20	22
			Replacement	49	49	49	49	49	50	50
			Employment	4,375	4,386	4,412	4,438	4,452	4,472	4,494
17.28.02	Administration of Justice	.0145	Total Demand	184	154	184	191	173	181	180
			Expansion	72	40	70	75	57	64	62
			Replacement	112	114	114	116	116	117	118
			Employment	7,732	7,772	7,842	7,917	7,974	8,038	8,100
17.29.01	Baker	.0280	Total Demand	115	127	140	146	144	143	137
			Expansion	50	61	72	76	72	69	61
			Replacement	65	66	68	70	72	74	76
			Employment	2,291	2,352	2,424	2,500	2,572	2,641	2,702
17.29.02	Commercial Cooking and Food Management	.0458	Total Demand	2,091	2,288	2,549	2,685	2,752	2,731	2,662
			Expansion	769	924	1,133	1,213	1,223	1,151	1,034
			Replacement	1,322	1,364	1,416	1,472	1,529	1,580	1,628
			Employment	28,896	29,820	30,953	32,166	33,389	34,540	35,574

SECTION 1
TRADE AND INDUSTRIAL OCCUPATIONS
Field: 17.00.00

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
17.29.04	Waiter/Waitress	.0546	Total Demand	2,612	2,866	3,216	3,396	3,512	3,484	3,416
			Expansion	929	1,121	1,395	1,494	1,526	1,420	1,283
			Replacement	1,683	1,745	1,821	1,902	1,986	2,064	2,133
			Employment	30,843	31,964	33,359	34,853	36,379	37,799	39,082
17.30.00	Refrigeration, See 17.01.00 Commercial Refrigeration/Air Conditioning Maintenance									
17.31.00	Small Engine Repair	.0191	Total Demand	35	39	40	41	42	44	43
			Expansion	19	23	24	24	25	26	25
			Replacement	16	16	16	17	17	18	18
			Employment	818	841	865	889	914	940	965
17.32.01	Electric Power Generation	.0202	Total Demand	103	98	98	92	85	92	97
			Expansion	50	44	44	37	29	36	40
			Replacement	53	54	54	55	56	56	57
			Employment	2,611	2,655	2,699	2,736	2,765	2,801	2,841
17.32.02	Waste and Waste Water Operation	.0182	Total Demand	12	13	14	14	14	15	14
			Expansion	6	6	7	7	7	8	7
			Replacement	6	7	7	7	7	7	7
			Employment	332	338	345	352	359	367	374
17.33.01	Custom Apparel Design and Construction	.0631	Total Demand	274	274	285	294	299	286	300
			Expansion	85	81	85	89	89	71	80
			Replacement	189	193	200	205	210	215	220
			Employment	2,988	3,069	3,154	3,243	3,332	3,403	3,483
17.33.02	Tailoring	.0628	Total Demand	272	272	283	290	296	282	299
			Expansion	85	80	85	87	88	70	81
			Replacement	187	192	198	203	208	212	218
			Employment	2,968	3,048	3,133	3,220	3,308	3,378	3,459
17.33.99	Power Sewing	.0550	Total Demand	347	345	360	372	378	362	383
			Expansion	121	114	121	127	126	104	119
			Replacement	226	231	239	245	252	258	264
			Employment	4,101	4,215	4,336	4,463	4,589	4,693	4,812
17.35.00	Upholstering	.0358	Total Demand	46	48	49	52	52	54	52
			Expansion	16	18	18	20	19	20	18
			Replacement	30	30	31	32	33	34	34
			Employment	823	841	859	879	898	918	936

SECTION 1
TRADE AND INDUSTRIAL OCCUPATIONS
Field: 17.00.00

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
17.36.01	Cabinet Making and Millwork	.0257	Total Demand	44	52	49	48	51	50	50
			Expansion	18	26	22	21	22	21	20
			Replacement	26	26	27	27	29	29	30
			Employment	1,009	1,035	1,057	1,078	1,100	1,121	1,141
17.99.00	Musical Instrument Service and Repair	.0465	Total Demand	13	13	13	14	14	13	13
			Expansion	3	3	3	4	4	3	3
			Replacement	10	10	10	10	10	10	10
			Employment	201	204	207	211	215	218	221
17.00.00	Trade and Industrial Occupations		Total Demand	18,110	20,135	20,112	20,013	19,995	20,308	20,422
			Expansion	7,868	9,583	9,244	8,829	8,502	8,512	8,332
			Replacement	10,242	10,552	10,868	11,184	11,493	11,796	12,090
	--- FIELD TOTAL ---		Employment	341,932	351,515	360,759	369,588	378,090	386,602	394,934

Section II

POTENTIAL/EMERGING VOCATIONAL EDUCATION PROGRAMS FOR THE STATE OF WASHINGTON

SECTION II

Agriculture Occupations

SECTION 2
AGRICULTURE OCCUPATIONS
Field: 01.00.00X

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
01.00.00X	Agriculture Occupations		Total Demand	0	0	0	0	0	0	0
			Expansion	0	0	0	0	0	0	0
	--- FIELD TOTAL ---		Replacement	0	0	0	0	0	0	0
			Employment	0	0	0	0	0	0	0

SECTION II

Distributive Education Occupations

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SECTION 2
DISTRIBUTIVE EDUCATION OCCUPATIONS
Field: 04.00.00X

Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
04.19.01X	Freight and Material Handlers	.0171	Total Demand	271	562	405	352	306	336	366
			Expansion	86	371	211	155	107	135	163
			Replacement	185	191	194	197	199	201	203
			Employment	10,747	11,118	11,329	11,484	11,591	11,726	11,889
04.19.02X	Garbage Collectors	.0146	Total Demand	24	22	24	21	18	17	16
			Expansion	12	10	12	9	6	5	4
			Replacement	12	12	12	12	12	12	12
			Employment	793	803	815	824	830	835	839
04.99.99X	Salesmen, NEC	.0454	Total Demand	92	99	100	100	99	102	100
			Expansion	22	27	27	26	24	25	23
			Replacement	70	72	73	74	75	77	77
			Employment	1,553	1,580	1,607	1,633	1,657	1,682	1,705
04.00.00X	Distributive Education Occupations --- FIELD TOTAL ---		Total Demand	387	683	529	473	423	455	482
			Expansion	120	408	250	190	137	165	190
			Replacement	267	275	279	283	286	290	292
			Employment	13,093	13,501	13,751	13,941	14,078	14,243	14,433

SECTION II

Health Occupations

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SECTION 2
HEALTH OCCUPATIONS
Field: 07.00.00X

Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
07.09.09X	Morticians	.0112	Total Demand	4	4	5	5	5	4	5
			Expansion	3	3	4	4	4	3	4
			Replacement	1	1	1	1	1	1	1
			Employment	77	80	84	88	92	95	99
07.99.99X	Other Health Technician	.0372	Total Demand	41	40	45	48	47	49	51
			Expansion	15	14	18	20	19	20	21
			Replacement	26	26	27	28	28	29	30
			Employment	691	705	723	743	762	782	803
07.00.00X	Health Occupations		Total Demand	45	44	50	53	52	53	56
	--- FIELD TOTAL ---		Expansion	18	17	22	24	23	23	25
			Replacement	27	27	28	29	29	30	31
			Employment	768	785	807	831	854	877	902

SECTION II

Home & Family Life Occupations

SECTION 2
HOME AND FAMILY LIFE OCCUPATIONS
Field: 09.00.00X

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
09.00.00X	Home and Family Life Occupations		Total Demand	0	0	0	0	0	0	0
			Expansion	0	0	0	0	0	0	0
			Replacement	0	0	0	0	0	0	0
	--- FIELD TOTAL ---		Employment	0	0	0	0	0	0	0

SECTION II

Business & Office Occupations

SECTION 2
BUSINESS AND OFFICE OCCUPATIONS
Field: 14.00.00X

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
14.04.01X	Telephone Operators	.0705	Total Demand	646	640	681	671	636	646	648
			Expansion	186	168	195	173	129	130	123
			Replacement	460	472	486	498	507	516	525
			Employment	6,521	6,689	6,884	7,057	7,186	7,316	7,439
14.05.01X	Expediters	.0232	Total Demand	180	173	172	172	167	184	184
			Expansion	84	76	73	71	65	80	79
			Replacement	96	97	99	101	102	104	105
			Employment	4,130	4,206	4,279	4,350	4,415	4,495	4,574
14.08.99X	Managers, NEC	.0323	Total Demand	98	110	102	103	101	106	105
			Expansion	23	33	25	26	22	27	24
			Replacement	75	77	77	77	79	79	81
			Employment	2,323	2,356	2,381	2,407	2,429	2,456	2,480
14.00.00X	Business and Office Occupations		Total Demand	924	923	955	946	904	936	937
			Expansion	293	277	293	270	216	237	226
			Replacement	631	646	662	676	688	699	711
	--- FIELD TOTAL ---		Employment	12,974	13,251	13,544	13,814	14,030	14,267	14,493

SECTION II

Technical Occupations

SECTION 2
TECHNICAL OCCUPATIONS
Field: 16.00.00X

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
16.06.06X	Mathematical Technical	.0039	Total Demand	1	0	1	1	1	2	0
			Expansion	1	0	1	1	1	2	0
			Replacement	0	0	0	0	0	0	0
			Employment	19	19	20	21	22	24	24
16.06.97X	Technicians, NEC	.0182	Total Demand	47	50	51	53	50	55	57
			Expansion	23	26	27	28	25	29	31
			Replacement	24	24	24	25	25	26	26
			Employment	1,329	1,355	1,382	1,410	1,435	1,464	1,495
16.00.00X	Technical Occupations		Total Demand	48	50	52	54	51	57	57
	--- FIELD TOTAL ---		Expansion	24	26	28	29	26	31	31
			Replacement	24	24	24	25	25	26	26
			Employment	1,348	1,374	1,402	1,431	1,457	1,488	1,519

SECTION II

Trade & Industrial Occupations

SECTION 2
TRADE AND INDUSTRIAL OCCUPATIONS
Field: 17.00.00X

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
17.08.01X	Sailors and Deckhands	.0200	Total Demand	38	35	33	34	28	31	31
			Expansion	18	15	13	13	7	10	10
			Replacement	20	20	20	21	21	21	21
			Employment	1,025	1,040	1,053	1,066	1,073	1,083	1,093
17.08.98X	Ship Officers	.0256	Total Demand	40	38	39	37	35	35	35
			Expansion	13	11	12	10	8	7	7
			Replacement	27	27	27	27	27	28	28
			Employment	1,013	1,024	1,036	1,046	1,054	1,061	1,068
17.10.06X	Plasterers	.0246	Total Demand	16	19	12	8	9	9	10
			Expansion	8	11	4	0	1	1	2
			Replacement	8	8	8	8	8	8	8
			Employment	327	338	342	342	343	344	346
17.10.07X	Plumbers	.0196	Total Demand	364	372	283	225	226	252	300
			Expansion	209	213	121	62	62	87	132
			Replacement	155	159	162	163	164	165	168
			Employment	7,888	8,101	8,222	8,284	8,346	8,433	8,565
17.10.09X	Glaziers	.0144	Total Demand	40	49	49	48	47	46	45
			Expansion	27	35	35	33	32	31	29
			Replacement	13	14	14	15	15	15	16
			Employment	951	986	1,021	1,054	1,086	1,117	1,146
17.10.10X	Roofers	.0101	Total Demand	56	65	36	16	19	20	26
			Expansion	42	51	22	2	5	6	11
			Replacement	14	14	14	14	14	14	15
			Employment	1,381	1,432	1,454	1,456	1,461	1,467	1,478
17.10.87X	Boilermakers	.0311	Total Demand	41	44	40	38	39	39	43
			Expansion	22	23	19	16	17	16	20
			Replacement	19	21	21	22	22	23	23
			Employment	639	662	681	697	714	730	750
17.10.88X	Asbestos Workers	.0134	Total Demand	32	35	22	16	15	18	23
			Expansion	22	25	12	6	5	8	13
			Replacement	10	10	10	10	10	10	10
			Employment	755	780	792	798	803	811	824
17.10.95X	Tile Setters	.0120	Total Demand	23	25	21	16	17	17	18
			Expansion	16	18	13	8	9	9	10
			Replacement	7	7	8	8	8	8	8
			Employment	570	588	601	609	618	627	637

SECTION 2
TRADE AND INDUSTRIAL OCCUPATIONS
Field: 17.00.00X

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
17.10.96X	Carpet Installers	.0113	Total Demand	44	51	45	40	42	41	39
			Expansion	31	38	31	26	28	26	24
			Replacement	13	13	14	14	14	15	15
			Employment	1,169	1,207	1,238	1,264	1,292	1,318	1,342
17.14.02X	Electric Power Linemen	.0151	Total Demand	17	14	14	12	9	10	10
			Expansion	10	7	7	5	2	3	3
			Replacement	7	7	7	7	7	7	7
			Employment	452	459	466	471	473	476	479
17.23.01X	Metal Molders	.0137	Total Demand	33	39	35	31	33	32	31
			Expansion	26	31	27	22	24	23	22
			Replacement	7	8	8	9	9	9	9
			Employment	557	588	615	637	661	684	706
17.23.04X	Assemblers	.0247	Total Demand	340	406	374	361	395	398	380
			Expansion	187	247	210	192	220	218	195
			Replacement	153	159	164	169	175	180	185
			Employment	6,187	6,434	6,644	6,836	7,056	7,274	7,469
17.23.07X	Tool and Die Makers	.0199	Total Demand	8	9	8	9	9	8	8
			Expansion	4	5	4	5	5	4	4
			Replacement	4	4	4	4	4	4	4
			Employment	198	203	207	212	217	221	225
17.23.9[illegible]X	Metal Working Trades, NEC	.0159	Total Demand	76	85	72	70	78	87	98
			Expansion	49	57	44	41	48	56	66
			Replacement	27	28	28	29	30	31	32
			Employment	1,721	1,778	1,822	1,863	1,911	1,967	2,033
17.23.98X	Shipfitters	.0218	Total Demand	23	14	15	13	14	17	25
			Expansion	13	4	5	3	4	7	14
			Replacement	10	10	10	10	10	10	11
			Employment	469	473	478	481	485	492	506
17.23.99X	Filers and Polishers	.0245	Total Demand	48	85	64	63	59	61	66
			Expansion	16	52	30	28	24	25	29
			Replacement	32	33	34	35	35	36	37
			Employment	1,326	1,378	1,408	1,436	1,460	1,485	1,514
17.29.03X	Butchers	.0234	Total Demand	24	28	26	25	23	23	23
			Expansion	8	12	10	8	6	6	6
			Replacement	16	16	16	17	17	17	17
			Employment	708	720	730	738	744	750	756

SECTION 2
TRADE AND INDUSTRIAL OCCUPATIONS
Field: 17.00.00X

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Date July, 1975

OE CODE	PROGRAM TITLE/REFERENCE	REPL. RATE	DEMAND/EMPLOYMENT	1976	1977	1978	1979	1980	1981	1982
17.29.98X	Meat Cutters	.0231	Total Demand	125	142	161	167	165	162	155
			Expansion	63	78	95	99	95	90	81
			Replacement	62	64	66	68	70	72	74
			Employment	2,668	2,746	2,841	2,940	3,035	3,125	3,206
17.29.99X	Bottling and Canning Operatives	.0292	Total Demand	58	64	66	61	56	57	57
			Expansion	16	21	22	17	12	12	12
			Replacement	42	43	44	44	44	45	45
			Employment	1,456	1,477	1,499	1,516	1,528	1,540	1,552
17.32.00X	Stationary Engineers and Firemen	.0262	Total Demand	134	164	151	145	138	149	164
			Expansion	46	74	60	53	44	54	68
			Replacement	88	90	91	92	94	95	96
			Employment	3,333	3,407	3,467	3,520	3,564	3,618	3,686
17.99.98X	Miscellaneous Mechanics/Repairmen, NEC	.0226	Total Demand	72	81	76	70	72	72	76
			Expansion	38	46	40	33	34	34	37
			Replacement	34	35	36	37	38	38	39
			Employment	1,532	1,578	1,618	1,651	1,685	1,719	1,756
17.99.99X	Checkers, Manufacturing	.0230	Total Demand	81	80	78	76	77	80	85
			Expansion	40	38	35	33	33	35	39
			Replacement	41	42	43	43	44	45	46
			Employment	1,771	1,809	1,844	1,877	1,910	1,945	1,984
17.00.00X	Trade and Industrial Occupations		Total Demand	1,733	1,944	1,720	1,581	1,605	1,664	1,748
			Expansion	924	1,112	871	715	725	768	834
			Replacement	809	832	849	866	880	896	914
	--- FIELD TOTAL ---		Employment	38,096	39,208	40,073	40,794	41,519	42,287	43,121

Section III

SPECIAL NEEDS STUDIES AND/OR SPECIFIC OCCUPATIONAL FORECASTS

Section 3 includes two major references to other related needs assessment and/or forecast projects, conducted on a statewide, regional, and local basis. These references are:

1. Research Projects funded by the Washington State Commission for Vocational Education - Research Coordinating Unit (RCU) - during fiscal years 1973 through 1975. Excerpts of project descriptions from the RCU Research Report is contained on pages 114 through 117. Additional information and/or copies of these project reports may be obtained by calling or writing to:

   Washington State Commission for
   Vocational Education
   Research Coordinating Unit
   Olympia, Washington 98504
   Phone: (206) 753-5672

2. A bibliography list of other known related work conducted throughout Washington State over the past two years. This listing is contained on page 118.

If you are aware of other similar projects, which should also be included, please forward this information to us on the self-addressed questionnaire form included in the Appendix.

PROJECT TITLE: Educational Needs Assessment of Eastern Lewis County
Project No. 4530

DIRECTOR: Jerry W. Shiveley and Norman J. Sadler

LOCATION: Tri-District Career Education Cooperative

DURATION: January 7, 1974 - March 1, 1974

Objective: To determine in the communities of Mossyrock, Morton, Onalaska, White Pass and their school districts, the educational needs of students an adults, so that long range educational planning may be more accurately carried out to eliminate duplication of small schools.

In determining the current and long range needs of the four communities, surveys of the following will be accomplished: 1) 1-5 year graduates, 2) current 8-12 graders, 3) major businesses and employers in the four communities, 4) staff of the four school districts, and 5) randomly selected parents throughout the four communities. The results will be analyzed and used as a basis of current and long range planning for course offerings.

PROJECT TITLE: Marine Clusters and Vocational Education Opportunities
Project No. 4532

DIRECTOR: Clark Eaton

LOCATION: Peninsula School District

DURATION: April 1, 1974 - June 30, 1974

To produce slide/tape materials for between 35-50 marine related occupations in the central Puget Sound area.

PROJECT TITLE: Walla Walla Area Vocational Needs Assessment
Project No. 4522

DIRECTOR: Philipp Scott

LOCATION: Walla Walla School District No. 140

DURATION: September 10, 1973 - June 30, 1974

Conduct an area-wide vocational needs assessment including the high school districts of Milton-Freewater, Touchet, Prescott, Waitsburg, Dayton and Walla Walla. Data will help establish educational specifications for a proposed vocational skill center to be built in Walla Walla School District No. 140.

PROJECT TITLE: Employment Opportunities for Graduates of Theatre Technology and Theatre Management Programs at the Community College Level
Project No. 75-5120(321)08

DIRECTOR: Simon Siegl

LOCATION: Bellevue Community College

DURATION: April 13, 1975 - September 30, 1975

AUDIENCE: Post-secondary Vocational Administrators/Creative Arts
Instructors

Theatre Technology is a program not currently offered in post-secondary institutions in Washington. This project will provide information on the job market needs for persons employed as Theatre Technologists or Theatre Managers. An Advisory Committee will assist with both local and national investigations of job needs and existing programs in this field. A recommendation will be made of the feasibility for offering a one or two year vocational program in Theatre Technology.

PROJECT TITLE: Determine the Need for Training of Mid-Management Personnel
in Whatcom County
Project No. 75-5110(344)08

DIRECTOR: Gary K. Glaze

LOCATION: Bellingham Vocational Technical Institute

DURATION: March 21, 1975 - December 30, 1975

AUDIENCE: Placement Personnel/Counselors/Mid-Management Instructors

A survey is being done to determine industry needs for persons with mid-management training. Training of a related nature that is being done by other area institutions will also be surveyed. It is expected that information will be used to determine if teaching certain classes in mid-management would benefit the job needs of the community.

PROJECT TITLE: Employment and Employment Training Needs of Older People
Project No. 75-5120(372)08

DIRECTOR: Robert E. Sarvis

LOCATION: Edmonds Community College

DURATION: April 1, 1975 - August 1, 1975

AUDIENCE: Post-secondary Continuing Education Directors/Vocational Dir.

The intent of this project is to examine the employment needs of older people in Snohomish County to identify changes needed in community college vocational education programs in order to provide non-traditional learning experiences for older unemployed workers. A survey will be used as the tool to interview 80 persons. It is expected that this investigation would disclose learning experiences needed for vocational retraining for this special target population.

PROJECT TITLE: Survey and Documentation of Vocational Skills/Needs and
Corresponding Job Availability in the Orting School District
Project No. 75-5120(060)08

DIRECTOR: Erline Polich, John Hovey

LOCATION: Orting School District #344

DURATION: August 4, 1974 - October 30, 1974
AUDIENCE: Vocational Administrators, Counselors

A series of questionnaires were developed and administered to determine vocational training needs of a rural school district (Orting, WA). The groups surveyed included parents of students, tenth and eleventh graders, past graduates and local representatives of business and industry. The questionnaires, procedures and findings could be of value to other school districts with interests in reassessing vocational program offerings. A variety of descriptive data was obtained which has benefited local educators planning vocational offerings. Of the respondents, about equal numbers (from 29 to 38%) planned on further training after graduation in vocational technical schools, 2-year community colleges and 4-year colleges. Students indicated Forestry, Automotive Repairing and Expanded Business, Machine Shop, and Agriculture as the popular vocational programs, if offered. The final report contains questionnaires, findings and a narrative summary of project events.

PROJECT TITLE: Recreational Area Management and Program Development
Project No. 75-5130(131)08
DIRECTOR: William J. Penhallegon
LOCATION: Wenatchee Valley College

DURATION: September, 1974 - June, 1975
AUDIENCE: Vocational Administrators, Management

Funds were utilized to develop and initiate a program to train persons to manage ski recreational areas. The program utilizes a ski-area which is a cooperative venture involving the Washington State Parks and Recreation Commission, Wenatchee Valley College, and the Mission Ridge Ski Resort. This program for training recreational area managers is an outgrowth of the ski instructors training program which has been offered by the college. Information is available through Dr. Wayne Johnson, Dean of Instruction, Wenatchee Valley College.

PROJECT TITLE: Marine Clusters and Vocational Education Opportunities
Project No. 74-4510(443)08
DIRECTOR: Clark Eaton
LOCATION: Peninsula School District

DURATION: April 1, 1974 - June 30, 1974
AUDIENCE: All Levels

A slide/tape presentation was produced and available in the summer of 1974 of 30 marine related occupations in the Central Puget Sound area. The project director interviewed marine related occupational personnel as well as researching agriculture and service brochures. The audio-visual tool is to be used to promote an understanding of marine related occupations and to help in developing vocational marine programs. The slide/tape presentation is available from the Curriculum Library, Washington State Commission for Vocational Education.

PROJECT TITLE: Enrollment Forecasting Project
Project No. 74-4556(131)08

DIRECTOR: Henry Polis

LOCATION: Washington State Board for Community College Education

DURATION: September 4, 1973 - June 15, 1975

AUDIENCE: Vocational Administrators - Secondary/Post-secondary

Data were compiled in specific occupations and geographic regions to supplement the state level efforts of forecasting for occupational training planning. The occupational/geographic areas of interest were; diesel and heavy equipment/Western Washington, air-conditioning/Eastern Washington, dental lab technician/Inland Empire Area (Spokane region including parts of Idaho), social services/statewide, agriculture mechanics/Western Washington, agriculture technical/Columbia Basin area and Impact of Trident Submarine Base/Bremerton area. Documents resulting from these studies will detail employment and training forecasts, and will be available after July 31, 1975.

BIBLIOGRAPHY LIST

- Other Known Related Work Conducted Throughout Washington State -

A Look at Allied Health Fields - Northwest Washington Area, Kelso, Washington: Northwest Educational Associates, June, 1975.

A Manpower Study of Social and Human Service Paraprofessionals in Washington State, Tacoma, Washington: Tacoma Community College and State Board for Community College Education, May, 1975.

A State of the Industry Survey - Diesel & Heavy Equipment Mechanics in the Western Washington Area, Kelso, Washington: Northwest Educational Associates, March, 1975.

A Study of Cooperative Vocational Education at Community Colleges in the State of Washington, Ellensburg, Washington: Central Washington State College, August, 1975.

Dental Auxiliary Utilization Survey Report - June, 1975, Seattle, Washington: Washington State Coordinating Committee for Dental Auxiliary Education, November, 1974.

Employment Trend Survey for Radiologic Technologists, Yakima, Washington: Yakima Valley College and Washington Society on Radiologic Technology, April, 1975.

Factors Influencing the Need for Dental Auxiliary Education Curriculum Changes: Washington State - 1974, Seattle, Washington: Washington State Coordinating Committee for Dental Auxiliary Education, November, 1974.

Farm Machinery Mechanics - Feasibility Study - Western Washington, Centralia, Washington: Centralia College, May, 1975.

APPENDIX

WASHINGTON STATE OCCUPATIONAL TRENDS

1970 - 1980

State of Washington
Employment Security Department
in Cooperation with the
Manpower Administration and the
Bureau of Labor Statistics of
the United States Department of
Labor
July 1974

WASHINGTON STATE OCCUPATIONAL TRENDS, 1970 - 1980

Introduction

The need for occupational information has become increasingly important in recent years. Manpower planning had only a minor role prior to the 1960's; nonetheless, information was needed on the demand for workers by occupation to enable the educational process to become more relevant. In recognition of this, the Vocational Education Act of 1963 and its amendments required the U. S. Department of Labor to provide occupational projections. Moreover, Manpower Revenue Sharing with its emphasis on further decentralization of the manpower planning processes has greatly increased the need for information on occupational manpower requirements at the state and local level.

The occupational employment projections in this report were designed to meet that need in this state. Projections of employment and total worker requirements for the period 1970 - 1980 are included for 385 individual occupations. The methodology for the projections was developed by the U. S. Bureau of Labor Statistics.

The occupational projections were based on the following assumptions:

1. Employment will continue to climb, and unemployment totals will decline from their current high levels;
2. No major event, such as widespread energy shortages, will substantially alter the rate of economic growth;
3. Economic, social, and educational trends will continue to change according to patterns of the recent past;
4. Scientific-technological advancements will continue at about the same rate as in recent years;
5. The United States will not be engaged in a war, although a still guarded relationship between the major powers will permit no substantial reduction in armaments beyond those already in effect.
6. The labor market area will be generally devoid of significant levels of commuting and migration.

While the occupational projections presented are considered reasonable in light of current economic conditions and trends and the above assumptions, they should not be viewed as precise estimates but as approximations of relative demand. They are intended as a guide for planning purposes to point out the direction of change only.

Methodology

The methodology used to prepare the occupational demand forecasts is a complex computerized system developed by the United States Bureau of Labor Statistics. The methodology is presented in simplified steps here.

1. Employment levels by industry were projected from 1970 to 1980 for 201 industries.

2. Both 1970 industry employment and projected 1980 industry employment were adjusted to a census employment concept. The adjustments included counting multiple job holders only in their primary occupation.

3. After adjustment, the employment of each industry was broken down into its occupational components using national staffing patterns. The components were summed to totals for over 400 occupations and 1970 - 1980 change factors (ratios) were computed.

4. Change factors were applied to Washington State occupational data contained in the 1970 Census of Population. This provided 1980 estimates of occupational employment in Washington State. Expansion demand by occupation was calculated by taking the difference between 1970 and 1980 employment levels.

5. Replacement requirements by occupation for the 1970 - 1980 period were determined by using 1970 death, retirement, and separation rates for Washington State.

6. The final step was to review the output and summarize the data into report form.

All steps in this methodology were accomplished in cooperation with the Manpower Administration and the U. S. Bureau of Labor Statistics. All data processing functions were performed by the U. S. Bureau of Labor Statistics. The cooperative effort assures comparability of data with national projections, with data produced by other participating states, and with future substate estimates. A detailed discussion on the methodology is contained in "Tomorrow's Manpower Needs, Research Report on Manpower Projection Methods, Bulletin 1769", U. S. Department of Labor.

Occupational Developments

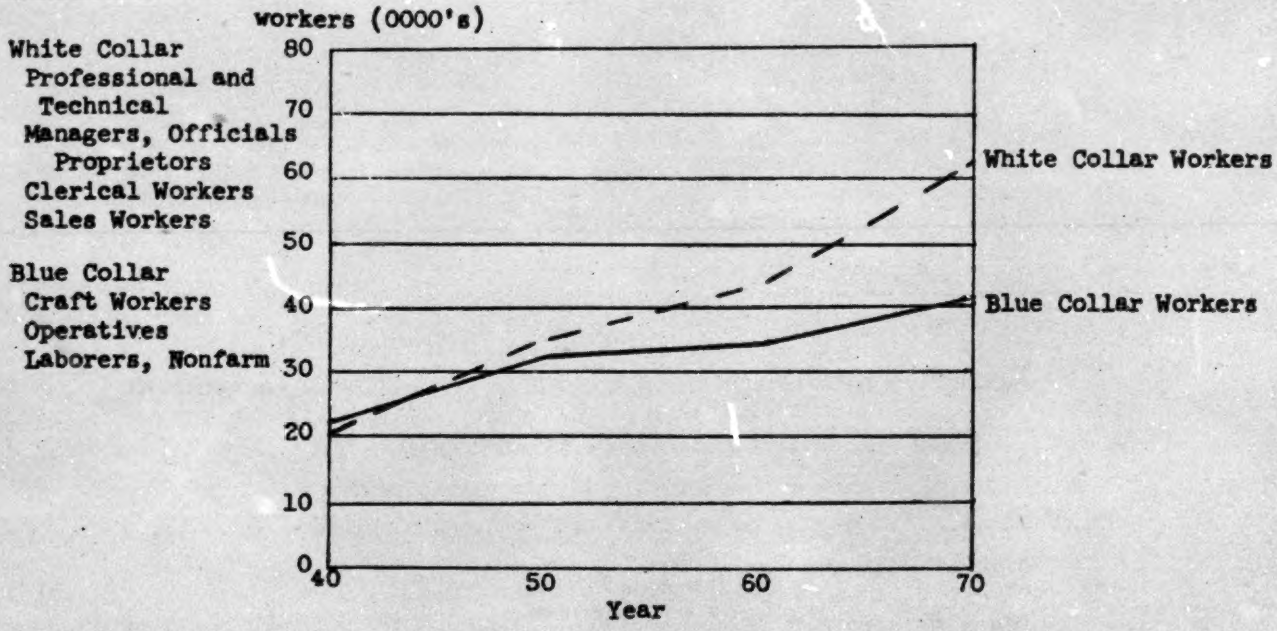
Table 1

OCCUPATIONAL EMPLOYMENT, WHITE COLLAR AND BLUE COLLAR WORKERS,
WASHINGTON STATE
ESTIMATED 1970 AND PROJECTED 1980

Occupation	Employment 1970	Employment 1980	1970-1980 Percent Change
Blue Collar Workers	367,530	407,650	10.9
Craft Workers	169,490	194,720	14.9
Operatives	143,920	156,910	9.0
Nonfarm Laborers	54,120	56,020	3.5
White Collar Workers	585,150	727,680	24.4
Professionals	198,690	249,830	25.7
Managers	109,550	139,630	27.5
Clerical Workers	190,070	231,520	21.8
Sales Workers	86,840	106,700	22.9

Occupational trends over the last several decades have resulted in a significantly higher number of white collar workers in Washington State than blue collar workers. Some time between 1940 and 1950, the number of workers employed in white collar occupations (professional and technical workers, managers-officials-proprietors, clerical workers, and sales workers) moved ahead of the number of workers employed in blue collar occupations (craft workers, operatives, and nonfarm laborers). The difference between the numbers employed in these two classifications has been growing, and this trend is projected to continue during the forecast period. The number of workers in white collar occupations will expand 24.4 percent from 1970 to 1980, while the number in blue collar occupations will increase by only 10.9 percent over the same period. Not included in the white or blue collar classifications, the service worker total will grow by 15.5 percent between 1970 and 1980 and the farmers and farm workers category will remain nearly constant, adding only 0.2 percent to its employment level.

WHITE COLLAR AND BLUE COLLAR OCCUPATIONAL GROWTH,
WASHINGTON STATE,
1940-1970



Source: Census of Population

The more rapid growth of the white collar and service worker groups corresponds to the greater relative expansion of the service-producing industries which employ a large proportion of these workers. The nature of the work performed in many white collar occupations prohibits mechanization or automation which sometimes slows occupational expansion.

Most blue collar workers are employed in goods-producing industries, and the use of labor-saving equipment in basic industry results in a lower growth rate for blue collar workers. Labor-saving techniques also limit employment growth for farm workers.

Table 2

CLASS OF WORKERS BY INDUSTRY PERCENT DISTRIBUTION, WASHINGTON STATE, 1970

Industry	Percent White Collar	Percent Blue Collar	Percent Service	Total
Contract Construction	26.4	72.7	0.9	100.0
Mining	27.5	70.3	2.2	100.0
Manufacturing	34.2	64.0	1.8	100.0
Transportation, Comm., Utilities	41.4	54.3	4.3	100.0
Trade	56.6	26.8	16.6	100.0
Services	61.8	11.0	27.2	100.0
Finance, Insurance, Real Estate	93.0	3.5	3.5	100.0

Source: 1970 Census of Population

Job openings created by labor force separations will be an important determinant of worker needs in most occupations during the 1970's. In fact, worker demand which results from the need to replace individuals who die, retire, or leave the labor force will outweigh worker demand resulting from industry expansion. The significance of replacement demand is greatest in those occupations expected to grow at a slower rate. Of the selected low and negative growth occupations listed in Table 3, virtually all the worker needs will be a result of labor force separations. By contrast, less than half of the worker demand in the high growth occupations listed in Table 4 will result from labor force separations.

Table 3

SELECTED LOW AND NEGATIVE GROWTH OCCUPATIONS, WASHINGTON STATE, 1970 - 1980*

Occupations	Total Worker Needs	Growth	Replacements
TOTAL	66,130	-1,270	67,400
Preschool and Kindergarten Teachers	1,020	80	940
Secondary School Teachers	5,510	220	5,290
Librarians	1,570	100	1,470
Officials and Public Administrators	1,410	40	1,370
Stenographers	730	- 630	1,360
Keypunch Operators	1,910	- 370	2,280
Telephone Operators	3,940	- 160	4,100
Ticket Station, Express Agents	800	- 40	840
Compositors and Typesetters	690	40	650
Bakers	510	30	480
Stationary Engineers	610	- 120	730
Assemblers	1,630	210	1,420
Clothing Ironers and Pressers	1,140	60	1,080
Miscellaneous Machine Operatives	3,730	20	3,710
Bartenders	1,980	220	1,760
Cooks	7,800	380	7,420
Waiters	14,870	1,020	13,850
Barbers	1,120	- 100	1,220
Construction Laborers	990	- 280	1,270
Freight and Material Handlers	1,830	310	1,520
Longshore Workers and Stevedores	550	0	550
Timber Cutting and Logging Workers	320	- 510	830
Farmers	7,340	- 430	7,770
Farm Wage Laborers	4,130	-1,360	5,490

*Selected on the basis of 5 percent or less growth with an employment level of 1,700 or more.

Table 4

SELECTED HIGH GROWTH OCCUPATIONS, WASHINGTON STATE, 1970 - 1980*

Occupations	Total Worker Needs	Growth	Replacements
TOTAL	32,960	18,670	14,290
Aero-Astronautic Engineers	3,600	2,860	740
Engineering Technicians	1,840	1,410	430
Therapists	1,500	720	780
Veterinarians	870	680	190
Clinical Lab Technologists and Technicians	2,110	1,010	1,100
Social Scientists	1,250	810	440
Health Specialties Teachers	830	580	250
Operations, Systems Researchers & Analysts	990	730	260
Vocational Education Counselors	2,690	1,480	1,210
Health Administrators	1,790	910	880
College Administrators	720	480	240
Legal Secretaries	1,670	610	1,060
Medical Secretaries	1,310	480	830
Teacher Aids	2,670	1,410	1,260
Air Conditioning, Heating and Refrigeration Mechanics, Repairers and Installers	1,330	890	440
Practical Nurses	5,620	2,090	3,530
Farm Managers	2,170	1,520	650

*Selected on the basis of employment level of 500 or more and expansion of 45 percent or more.

Professional and Technical

Professional, technical and kindred workers compose the largest occupational group in Washington State. Included in the group are such occupations as engineers, teachers, doctors, lawyers, designers, and draftsmen. There will be 120,460 openings for professional, technical and kindred workers in the 1970's. Of these 57.5 percent will be openings due to labor force separations and 42.5 percent will be openings due to growth.

The high rate of growth of the professional, technical, and kindred group will result from a continued trend toward the solution of the nation's socioeconomic problems and by a continued effort to advance technology by developing alternate energy sources, improving transportation systems, and generally providing a better way of life.

Managers, Officials, and Proprietors

The managers, officials, and proprietors category is expected to have a total worker need of 66,460 in the 1970's. Of that need 54.7 percent will be openings due to labor force separations and 45.3 percent will be openings due to growth. Such occupations as bank managers, buyers, assessors, school administrators, ships officers, and inspectors are found in the group. Opportunities for managers, officials, and proprietors will grow as industry and governments expand and place greater emphasis on the skills required in these occupations. It is expected that most of the growth will be in larger firms as the tendency is for them to absorb smaller firms and to be highly competitive with individual proprietorships.

Sales Workers

There will be a total of 57,300 new sales workers needed to fill the vacancies that will develop between 1970 and 1980. Of these openings 65.3 percent will be to replace workers who leave the labor force and 34.7 percent will be new jobs created by industrial employment growth. Advertising agents, insurance agents, real estate agents, and sales clerks and sales workers are representative of occupations in the sales worker group. Greater affluence and higher individual incomes will be major factors in the continued demand for sales workers.

Clerical Workers

As a result of a high rate of labor force separations, the clerical worker category will require the largest number of new workers of any of the broad occupational groups. About half of all of the workers in this group will be replaced during the ten-year span. Of 155,220 openings between 1970 and 1980, 73.3 percent will be due to labor force separations and 26.7 percent will be due to growth. Occupations in the clerical worker field will generally have a much higher than average demand. Exceptions will be occupations where increases in productivity and improved technology will reduce the worker need. Three significant occupations that will employ fewer workers in 1980 than in 1970 are stenographers, keypunch operators, and telephone operators.

Craft and Kindred Workers

Industrial employment growth will result in 25,230 new openings for craft and kindred workers between 1970 and 1980. That is 40.3 percent of the projected total worker need for craft workers in the 1970's. There will be an additional 37,310 openings created by labor force separations, 59.7 percent of the total. Included in the craft workers group are such occupations as carpenters, bulldozer operators, electricians, plumbers, machinists, sheet metal workers, mechanics, and bakers. Technological advancements will limit expansion in some of these occupations. On the other hand, there will be others that benefit from advancement in technology. Among the latter are air conditioning mechanics and installers and data processing machine repairers. Radio and television repairers and auto body repairers will be among those being limited by improvements in product reliability.

Operatives

Most opportunities as operatives will result from replacement of workers already employed as operatives. Of a total 49,530 openings, 73.8 percent will be due to labor force separations. Industrial employment growth will account for 26.2 percent of the total worker needs for operatives. A mixture of technical innovations and industrial developments will have a varied effect on the many operative occupations. One occupation that will be positively affected by events (mostly by growth in the industries employing them) will be welders and flamecutters which will expand significantly. Other types of work performed by operatives include machine operations, packaging, inspecting assembly operations; and driving trucks, buses and taxies.

Service Workers

Labor force separations will create 79.0 percent of the 110,070 openings for service workers between 1970 and 1980. Employment growth will vary among the occupations, but will represent 21.0 percent of total openings. Typical of tasks performed by service workers are personal and property protection, house cleaning, personal services, food services, and health services. Changing individual needs and productivity advancements will play important roles in determining the future needs for service workers.

Laborers

Openings for nonfarm laborers are projected at 12,850 between 1970 and 1980. Of the total, 14.8 percent will be due to growth and 85.2 percent will be due to labor force separations. While industries employing large numbers of laborers such as construction and manufacturing will be growing, increases in productivity and the use of labor-saving machinery will limit the number of laborers needed.

Farmers and Farm Workers

The number of people working as farmers and farm workers will remain nearly constant during the 1970's. Of a projected total worker need of 14,750, only 0.4 percent will be for employment growth. Labor force separations will account for 99.6 percent of the opportunities. The size of farms and the trend to corporate farms will influence the occupational structure significantly. The number of farm laborers will decrease and employment of farm managers will more than double as their skills will be needed to run the larger farms.

Demand Occupations

The high demand occupations in Table 5 are those requiring an annual need of 500 or more workers. The most common characteristic among the high demand occupations is the relatively large need for replacements that will exist in the 1970's. Labor force separations will generate 75.5 percent of the worker needs for the group while expansion will produce 24.5 percent. The total requirements of the listed high demand occupations will represent 38.8 percent of all worker needs for the 1970's.

It is significant that only four of the high demand occupations require a college degree for entrance. Though the professional, technical, and kindred group is growing the fastest, the overwhelming majority of opportunities will be in occupations needing less education. That fact, however, does not eliminate a need for some post-high school training. Post-high school experience will continue to be a requirement for entrance into most of the high demand occupations.

Table 5

OCCUPATIONS HAVING THE GREATEST WORKER DEMAND, WASHINGTON STATE, 1970 - 1980*

Occupation	Percent of Total Needs	Total Worker Needs	Job Openings Due to: Growth	Replacement
TOTAL	38.8	251,870	61,770	190,100
Secretaries, Except Legal and Medical..........................	6.1	39,920	11,560	28,360
Sales Clerks Retail Trade.........	4.3	27,620	8,250	19,370
Bookkeepers.......................	2.8	17,920	3,290	14,630
Waiters...........................	2.3	14,870	1,020	13,850
Janitors and Sextons..............	2.2	14,600	4,270	10,330
Elementary School Teachers........	2.2	14,130	2,050	12,080
Typists...........................	1.7	11,330	1,790	9,540
Cashiers..........................	1.6	10,620	3,090	7,530
Nurses Aids and Orderlies.........	1.4	9,210	2,290	6,920
Cooks, Except Private.............	1.2	7,800	380	7,420
Child Care Workers................	1.2	7,690	1,460	6,230
College and University Teachers...	1.2	7,510	4,420	3,090
Accountants.......................	1.2	7,490	2,490	5,000
Farmers...........................	1.1	7,340	- 430	7,770
Hairdressers and Cosmetologists...	1.1	7,240	1,570	5,670
Truck Drivers.....................	1.0	6,500	3,330	3,170
Receptionist......................	1.0	6,330	1,180	5,150
Real Estate Agents and Brokers....	1.0	6,240	2,190	4,050
Carpenters........................	0.9	6,150	1,820	4,330
Practical Nurses..................	0.9	5,620	2,090	3,530
Secondary School Teachers.........	0.8	5,510	220	5,290
Sales Workers, Except Clerks Retail Trade.....................	0.8	5,150	2,550	2,600
Private Household Cleaners and Servants.......................	0.8	5,080	890	4,190

* Selected on the basis of annual demand of 500 or more.

Table 6

Washington State 1970 Employment, Projected 1980 Requirements and Worker Needs

1970-1980 by Occupation

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/ Total	Openings Due To Growth	Openings Due To Labor Force Separations
TOTAL LISTED OCCUPATIONS 1/	1,140,950	1,346,810	18.0	649,180	205,860	443,320
Professional, Technical, Kindred	198,690	249,830	25.7	120,460	51,140	69,320
Engineers, Technical	28,930	38,710	33.8	13,540	9,780	3,760
Engineers, Aero-astronautic	5,720	8,580	50.0	3,600	2,860	740
Chemical	790	910	15.2	220	120	100
Civil	5,030	5,670	12.7	1,500	640	860
Electrical	5,400	7,330	35.7	2,700	1,930	770
Industrial	3,150	4,220	34.0	1,530	1,070	460
Mechanical	4,400	5,980	35.9	1,660	1,580	80
Metallurgical	270	380	40.7	140	110	30
Sales	650	850	30.8	310	200	110
Other	3,520	4,790	36.1	1,880	1,270	610
Life and Physical Scientists	2,890	3,560	23.2	1,340	670	670
Agricultural Scientists	420	510	21.4	180	90	90
Atmospheric and Space Scientists	140	170	21.4	60	30	30
Biological Scientists	670	780	16.4	320	110	210
Chemists	1,140	1,450	27.2	580	310	270
Geologists	140	170	21.4	50	30	20
Marine Scientists	70	110	57.1	50	40	10
Physicists and Astronomers	310	370	19.4	100	60	40
Mathematical Specialists	570	720	26.3	280	150	130
Actuaries	70	90	28.6	30	20	10
Mathematicians	90	130	44.4	50	40	10
Statisticians	410	500	22.0	200	90	110
Engineers, Science Technicians	13,870	19,200	38.4	8,110	5,330	2,780
Agricultural and Biological Technicians, Except Health	570	840	47.4	540	270	270
Chemical Technicians	680	790	16.2	270	110	160
Draftsmen	4,410	5,780	31.1	2,150	1,370	780

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/		
				Total	Openings Due To Growth	Openings Due To Labor Force Separations
Electrical and Electronic Engineering Technicians	2,820	4,230	50.0	1,840	1,410	430
Surveyors	1,520	1,740	14.5	480	220	260
Engineering, Science Technician, n.e.c.	3,870	5,820	50.4	2,830	1,950	880
Medical Workers, Except Technicians	26,900	33,680	25.2	20,920	6,780	14,140
Chiropractors	310	420	35.5	250	110	140
Dentists	1,870	2,290	22.5	1,080	420	660
Dietitians	490	600	22.4	390	110	280
Optometrists	310	390	25.8	170	80	90
Pharmacists	2,150	2,570	19.5	1,260	420	840
Physicians, Medical and Osteopaths	4,750	5,240	10.3	1,840	490	1,350
Podiatrists	70	80	14.3	60	10	50
Registered Nurses	15,060	18,800	24.8	13,500	3,740	9,760
Therapists	1,390	2,110	51.8	1,500	720	780
Veterinarians	500	1,180	136.0	870	680	190
Health Technologists and Technicians	4,240	6,820	60.8	5,200	2,580	2,620
Clinical Lab Technologists and Tech.	1,730	2,740	58.4	2,110	1,010	1,100
Dental Hygienists	330	610	84.8	540	280	260
Health Record Technologists, and Tech.	280	590	110.7	570	310	260
Radiologic Technologists and Tech.	750	1,000	33.3	680	250	430
Other Health Technologists and Tech.	1,150	1,880	63.5	1,300	730	570
Technicians, Except Health	4,510	5,810	28.8	2,000	1,300	700
Airplane Pilots	1,730	1,930	11.6	380	200	180
Air Traffic Controllers	640	800	25.0	260	160	100
Flight Engineers	660	950	43.9	360	290	70
Radio Operators	580	650	12.1	230	70	160
Tool Programers, Numerical	80	80	0	0	0	0
Other Technicians, Except Health	820	1,400	70.7	770	580	190
Computer Specialists	3,910	4,720	20.7	1,430	810	620
Computer Programers	2,320	2,750	18.5	830	430	400
Computer Systems Analysts	1,330	1,670	25.6	530	340	190

				WORKER NEEDS 1970-1980 2/		
Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	Total	Openings Due To Growth	Openings Due To Labor Force Separations
Other Computer Specialists	260	300	15.4	70	40	30
Social Scientists	1,650	2,460	49.1	1,250	810	440
Economists	870	1,220	40.2	530	350	180
Psychologists	490	800	63.3	530	310	220
Urban and Regional Planners	250	380	52.0	160	130	30
Other Social Scientists	40	60	50.0	30	20	10
Teachers	56,030	63,820	13.9	31,010	7,790	23,220
College and University Teachers	10,330	14,750	42.8	7,510	4,420	3,090
Agriculture Teachers	80	100	25.0	20	20	0
Art, Drama, Music Teachers	540	740	37.0	340	200	140
Atmospheric, Earth, Marine Teachers	120	190	58.3	80	70	10
Biology Teachers	360	530	47.2	250	170	80
Business, Commerce Teachers	410	610	48.8	350	200	150
Chemistry Teachers	240	270	12.5	70	30	40
Coaches, Physical Education Teachers	320	370	15.6	140	50	90
Economics Teachers	190	260	36.8	100	70	30
Education Teachers	180	200	11.1	60	20	40
Engineering Teachers	430	490	14.0	130	60	70
English Teachers	790	940	19.0	390	150	240
Foreign Language Teachers	450	680	51.1	440	230	210
Health Specialties Teachers	680	1,260	85.3	830	580	250
History Teachers	310	320	3.2	50	10	40
Home Economics Teachers	120	170	41.7	130	50	80
Law Teachers	60	100	66.7	40	40	0
Mathematics Teachers	510	690	35.3	300	180	120
Physics Teachers	280	250	- 10.7	10	- 30	40
Psychology Teachers	310	520	67.7	290	210	80
Sociology Teachers	170	340	100.0	220	170	50
Social Science Teachers n.e.c.	230	370	60.9	190	140	50
Theology Teachers	50	80	60.0	40	30	10
Trade Industrial and Tech. Teachers	90	160	77.8	100	70	30
College and University Teachers n.e.c.	3,410	5,110	49.9	2,940	1,700	1,240

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/ Total	Openings Due To Growth	Openings Due To Labor Force Separations
Elementary and Secondary School Teachers	41,630	43,980	5.6	20,660	2,350	18,310
Elementary School Teachers, Exc. Preschool and Kindergarten	22,810	24,860	9.0	14,130	2,050	12,080
Preschool and Kindergarten Teachers	1,850	1,930	4.3	1,020	80	940
Secondary School Teachers	16,970	17,190	1.3	5,510	220	5,290
Teachers n.e.c.	4,070	5,090	25.1	2,840	1,020	1,820
Writers, Artists, Entertainers	12,050	14,920	23.8	6,950	2,870	4,080
Actors	110	110	0	60	0	60
Athletes and Kindred Workers	1,270	1,580	24.4	720	310	410
Authors	380	390	2.6	130	10	120
Dancers	110	130	18.2	140	20	120
Designers	1,250	1,570	25.6	690	320	370
Editors and Reporters	1,860	2,480	33.3	1,330	620	710
Musicians and Composers	1,810	2,240	23.8	1,030	430	600
Painters and Sculptors	1,440	1,700	18.1	760	260	500
Photographers	1,060	1,150	8.5	420	90	330
Public Relations Specialists and Publicity Writers	1,420	1,800	26.8	910	380	530
Radio and TV Announcers	450	530	17.8	120	80	40
Writers, Artists and Entertainers,n.e.c.	890	1,240	39.3	640	350	290
Other Professional, Technical and Kindred Workers	43,140	55,410	28.4	28,430	12,270	16,160
Accountants	12,950	15,440	19.2	7,490	2,490	5,000
Architects	1,570	2,030	29.3	860	460	400
Archivists and Curators	100	130	30.0	70	30	40
Clergy	3,510	5,050	43.9	2,870	1,540	1,330
Religious, Except Clergy	690	950	37.7	700	260	440
Farm Management Advisors	100	90	- 10.0	10	- 10	20
Foresters, Conservationists	1,700	2,120	24.7	750	420	330
Home Management Advisors	80	70	- 12.5	30	- 10	40

				WORKER NEEDS 1970-1980 2/		
Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	Total	Openings Due To Growth	Openings Due To Labor Force Separations
Lawyers and Judges	3,970	5,010	26.2	2,300	1,040	1,260
Librarians	2,460	2,560	4.1	1,570	100	1,470
Operations, Systems Researchers & Analysts	1,610	2,340	45.3	990	730	260
Personnel Labor Relations	4,960	6,660	34.3	3,450	1,700	1,750
Research Workers, n.e.c.	1,920	2,840	47.9	1,440	920	520
Recreation Workers	900	1,140	26.7	570	240	330
Social Workers	3,860	4,740	22.8	2,640	880	1,760
Vocational Education Counselors	2,760	4,240	53.6	2,690	1,480	1,210
MANAGERS, OFFICIALS, PROPRIETORS	109,550	139,630	27.5	66,460	30,080	36,380
Buyers, Sales, Loan Managers	21,620	28,070	29.8	11,780	6,450	5,330
Bank and Financial Managers	6,180	8,370	35.4	4,180	2,190	1,990
Credit and Collection Managers	1,000	1,190	19.0	510	190	320
Buyers, Shippers, Farm Products	330	320	- 3.0	110	- 10	120
Buyers, Wholesale, Retail Products	2,890	3,830	32.5	2,050	940	1,110
Purchasing Agents, Buyers, n.e.c.	2,980	3,450	15.8	1,240	470	770
Sales Manager, Retail Trade	3,940	5,560	41.1	1,720	1,620	100
Sales Manager, Except Retail Trade	4,300	5,350	24.4	1,970	1,050	920
Administrators, Public Inspectors	13,360	15,480	15.9	6,760	2,120	4,640
Assessors, Controllers, and Treasurers, Local Public Admin.	610	560	- 8.2	240	- 50	290
Construction Inspector, Public Admin.	390	400	2.6	140	10	130
Health Administrators	1,820	2,730	50.0	1,790	910	880
Inspectors, Except Construction, Public Administration	1,780	2,360	32.6	1,180	580	600
Officials and Public Administrators	4,340	4,380	0.9	1,410	40	1,370
Postmasters and Mail Supervisors	640	580	- 9.4	220	- 60	280
School Administrators, College	690	1,170	69.6	720	480	240
School Administrators, Elementary and Secondary	3,090	3,300	6.8	1,060	210	850
Other Managers, Officials, and Proprietors	74,570	96,080	28.8	47,920	21,510	26,410
Managers, Superintendents, Building	2,490	3,570	43.3	3,160	1,080	2,080
Office Managers, n.e.c.	4,310	6,030	39.9	3,500	1,720	1,780

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/ Total	Openings Due To Growth	Openings Due To Labor Force Separations
Officers, Pilots, Pursers, Ship	1,190	1,180	- 0.8	20	- 10	30
Officials of Lodges, Unions	1,120	1,510	34.8	870	390	480
Railroad Conductors	640	700	9.4	280	60	220
Restaurant, Cafe, and Bar Managers	4,860	5,130	5.6	2,040	270	1,770
Other Managers and Administrators	59,960	77,960	30.0	38,050	18,000	20,050
SALES WORKERS	86,840	106,700	22.9	57,300	19,860	37,440
Advertising Agents and Sales Workers	1,090	1,460	33.9	760	370	390
Auctioneers	80	80	0	30	0	30
Demonstrators	890	900	1.1	530	10	520
Hucksters and Peddlers	3,470	3,990	15.0	2,540	520	2,020
Insurance Agents, Brokers, Etc.	7,060	9,130	29.3	4,130	2,070	2,060
Newspaper Carriers and Vendors	1,370	1,370	0	250	0	250
Real Estate Agents, Brokers	8,280	10,470	26.4	6,240	2,190	4,050
Stock and Bond Sales Agents	1,630	1,860	14.1	720	230	490
Sales Representatives, Manufacturing	5,250	6,330	20.6	2,270	1,080	1,190
Sales Representatives, Wholesale Trade	12,230	14,110	15.4	4,640	1,880	2,760
Sales Clerks, Retail Trade	33,600	41,850	24.6	27,620	8,250	19,370
Sales Workers, Except Clerks Retail Trade	7,760	10,310	32.9	5,150	2,550	2,600
Sales Workers, Service and Construction	4,130	4,840	17.2	2,420	710	1,710
CLERICAL WORKERS	190,070	231,520	21.8	155,220	41,450	113,770
Stenographers, Typists, and Secretaries	54,560	73,650	35.0	60,240	19,090	41,150
Secretaries, Legal	1,310	1,920	46.6	1,670	610	1,060
Secretaries, Medical	1,060	1,540	45.3	1,310	480	830
Secretaries, Other	37,240	52,140	40.0	43,260	14,900	28,360
Stenographers	2,510	1,880	- 25.1	730	- 630	1,360
Typists	12,440	16,170	30.0	13,270	3,730	9,540
Office Machine Operators	8,070	8,710	7.9	4,780	640	4,140
Bookkeeping, Billing Operators	1,070	1,210	13.1	870	140	730
Calculating Machine Operators	540	540	0	300	0	300
Computer, Peripheral Equipment Operators	1,690	2,420	43.2	1,270	730	540

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/ Total	Openings Due To Growth	Openings Due To Labor Force Separations
Duplicating Machine Operators	360	430	19.4	290	70	220
Keypunch Operators	3,690	3,320	- 10.0	1,910	- 370	2,280
Other Office Machine Operators	720	790	9.7	140	70	70
Other Clerical Workers	127,440	149,160	17.0	90,200	21,720	68,480
Bank Tellers	4,850	6,000	23.7	4,710	1,150	3,560
Billing Clerks	1,310	1,880	43.5	1,480	570	910
Bookkeepers	25,850	29,140	12.7	17,920	3,290	14,630
Cashiers	12,760	15,850	24.2	10,620	3,090	7,530
Clerical Supervisors, n.e.c.	1,850	2,140	15.7	940	290	650
Collectors, Bill and Account	970	1,190	22.7	610	220	390
Counter Clerks, Except Food	3,630	5,150	41.9	3,920	1,520	2,400
Dispatcher and Starter, Vehicle	1,380	1,620	17.4	720	240	480
Enumerators and Interviewers	1,260	1,120	- 11.1	390	- 140	530
Estimators and Investigators, n.e.c.	5,350	6,410	19.8	3,370	1,060	2,310
Expeditors and Production Controllers	3,770	3,950	4.8	1,090	180	910
File Clerks	4,590	4,820	5.0	3,680	230	3,450
Insurance Adjusters, Examiners, and Investigators	1,690	2,210	30.8	1,110	520	590
Library Attendants, Assistants	2,640	3,030	14.8	2,380	390	1,990
Mail Carriers, Post Office	4,090	4,440	8.6	1,240	350	890
Mail Handler, Except Post Office	1,800	2,210	22.8	1,450	410	1,040
Messenger and Office Helpers	1,010	870	- 13.9	300	- 140	440
Meter Readers, Utilities	540	550	1.9	90	10	80
Payroll, Time Keeping Clerks	1,570	1,860	18.5	1,220	290	930
Postal Clerks	4,720	4,890	3.6	1,930	170	1,760
Proofreaders	310	450	45.2	370	140	230
Real Estate Appraisers	610	770	26.2	380	160	220
Receptionists	6,650	7,830	17.7	6,330	1,180	5,150
Shipping, Receiving Clerks	4,380	4,760	8.7	1,460	380	1,080
Statistical Clerks	3,800	4,070	7.1	2,430	270	2,160
Stock Clerks, Store Keepers	6,700	7,570	13.0	3,150	870	2,280
Teacher Aides, Except Monitors	2,230	3,640	63.2	2,670	1,410	1,260

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/		
				Total	Openings Due To Growth	Openings Due To Labor Force Separations
Telegraph Operators	440	350	-20.5	70	-90	160
Telephone Operators	5,730	5,570	-2.8	3,940	-160	4,100
Ticket Station, Express Agents	2,140	2,100	-1.9	800	-40	840
Weighers	350	340	-2.9	40	-10	50
Misc. Clerical Workers, n.e.c.	8,470	12,380	46.2	9,390	3,910	5,480
CRAFT AND KINDRED WORKERS	169,490	194,720	14.9	62,540	25,230	37,310
Construction Craft Workers	50,870	60,190	18.3	20,810	9,320	11,490
Carpenters	16,260	18,080	11.2	6,150	1,820	4,330
Carpenters Apprentices	230	280	21.7	60	50	10
Brickmasons and Stonemasons & Apprent.	1,370	1,540	12.4	450	170	280
Bulldozer Operators	1,890	2,150	13.8	610	260	350
Cement and Concrete Finishers	990	1,320	33.3	540	330	210
Electricians	9,690	12,540	29.4	4,810	2,850	1,960
Electricians Apprentice	340	440	29.4	110	100	10
Excavating, Grading, Machine Operators	4,690	5,150	9.8	1,350	460	890
Floor Layers, Except Tile Setters	590	670	13.6	150	80	70
Painters, Construction, and Maintenance and Apprentices	4,960	6,200	25.0	2,690	1,240	1,450
Paperhangers	50	70	40.0	30	20	10
Plasterers & Apprentices	310	300	-3.2	60	-10	70
Plumbers and Pipefitters	6,570	7,890	20.1	2,750	1,320	1,430
Plumbers, Pipefitters Apprentices	170	200	17.6	30	30	0
Roofers and Slaters	1,000	1,360	36.0	470	360	110
Structural Metal Workers	1,330	1,550	16.5	480	220	260
Tilesetters	430	450	4.7	70	20	50
Blue Collar Worker Supervisors n.e.c.	22,210	24,380	9.8	7,170	2,170	5,000
Metalworking Craft Workers, Except Mechanical	17,790	19,650	10.5	5,830	1,860	3,970
Blacksmiths	230	210	-8.7	50	-20	70
Boilermakers	820	840	2.4	280	20	260

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/ Total	 Openings Due To Growth	 Openings Due To Labor Force Separations
Heat Treaters, Annealers, Etc.	130	120	-7.7	10	-10	20
Forge and Hammer Operators	80	90	12.5	30	10	20
Job and Die Setters, Metal	180	220	22.2	70	40	30
Machinists & Apprentices	7,950	9,000	13.2	2,850	1,050	1,800
Millwrights	1,840	1,970	7.1	620	130	490
Molders, Metal and Apprentices	480	530	10.4	110	50	60
Pattern and Model Makers	770	820	6.5	210	50	160
Rollers and Finishers, Metal	60	70	16.7	20	10	10
Sheet Metal Workers, Tinsmiths	3,240	3,350	3.4	760	110	650
Sheet Metal Worker Apprentice	190	230	21.1	40	40	0
Tool and Diemakers and Apprentices	1,820	2,200	20.9	780	380	400
Mechanics, Repairers and Installers	41,970	50,030	19.2	15,700	8,060	7,640
Air Conditioning, Heating, Refrigeration	1,420	2,310	62.7	1,330	890	440
Aircraft	8,030	11,440	42.5	4,630	3,410	1,220
Automobile Accessories Installers	110	100	-9.1	-10	-10	0
Automotive Body Repairers	1,910	1,970	3.1	270	60	210
Automobile Mechanics	12,220	13,260	8.5	3,370	1,040	2,330
Automobile Mechanics Apprentice	150	180	20.0	30	30	0
Data Processing Machine Repairers	510	770	51.0	310	260	50
Farm Implement	550	620	12.7	180	70	110
Heavy Equipment Mechanics, Including Diesel	8,000	9,360	17.0	3,160	1,360	1,800
Household Appliance Mechanics	1,900	2,410	26.8	550	510	40
Office Machine Repairers	750	850	13.3	210	100	110
Radio, Television Repairers	2,430	2,610	7.4	630	180	450
Railroad, Car Shop Repairers	950	990	4.2	290	40	250
Mechanics Except Automobile Apprentice	80	100	25.0	20	20	0
Other Mechanics and Repairers	2,960	3,060	3.4	730	100	630
Printing Trade Crafts Workers	4,640	4,960	6.9	1,720	320	1,400
Bookbinders	390	410	5.1	240	20	220
Compositors and Typesetters	1,870	1,910	2.1	690	40	650
Electrotypers and Stereotypers	130	130	0	20	0	20
Engravers Except Photoengravers	100	110	10.0	80	10	70

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/ Total	Openings Due To Growth	Openings Due To Labor Force Separations
Photoengravers and Lithographers	240	320	33.3	150	80	70
Printing Press Operators and Apprentices	1,910	2,080	8.9	540	170	370
Transportation, Public Utilities Craft Workers	9,150	10,080	10.2	2,240	930	1,310
Electric Power Line and Cable Installers, Repairers	1,930	2,190	13.5	560	260	300
Locomotive Engineers	1,160	1,270	9.5	440	110	330
Locomotive Firemen	260	190	- 26.9	- 40	- 70	30
Power Station Operators	740	680	- 8.1	80	- 60	140
Telephone Installers and Repairers	3,940	4,640	17.8	1,140	700	440
Telephone Line Installers and Repairers	1,120	1,110	- 0.9	60	- 10	70
Other Craft and Kindred Workers	22,860	25,430	11.2	9,070	2,570	6,500
Bakers	1,690	1,720	1.8	510	30	480
Cabinet Makers	1,370	1,440	5.1	430	70	360
Carpet Installers	840	1,070	27.4	330	230	100
Crane, Derrick, and Hoist Operators	3,650	4,290	17.5	1,320	640	680
Decorators, Window Dressers	1,030	1,230	19.4	760	200	560
Dental Laboratory Technicians	620	780	25.8	350	160	190
Furniture and Wood Finishers	200	190	- 5.0	50	- 10	60
Glaziers	730	960	31.5	350	230	120
Inspectors, Log and Lumber	1,460	1,620	11.0	550	160	390
Inspectors, Other	1,800	1,960	8.9	720	160	560
Jewelers and Watchmakers	510	510	0	220	0	220
Millers, Grain, Flour, Feed	80	90	12.5	30	10	20
Motion Picture Projectionists	320	270	- 15.6	30	- 50	80
Opticians, Lens Grinder, Polisher	430	550	27.9	230	120	110
Piano and Organ Tuners and Repairers	130	120	- 7.7	50	- 10	60
Shipfitters	1,130	1,470	30.1	570	340	230
Shoe Repairers	360	360	0	230	0	230
Sign Painters and Letterers	390	320	- 17.9	60	- 70	130
Stationary Engineers	2,670	2,550	- 4.5	610	- 120	730
Tailor	710	810	14.1	600	100	500
Upholsterers	920	1,060	15.2	510	140	370

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/ Total	Openings Due To Growth	Openings Due To Labor Force Separations
Craft and Kindred Workers, n.e.c.	1,820	2,060	13.2	560	240	320
OPERATIVES	143,920	156,910	9.0	49,530	12,990	36,540
Operatives, Except Transportation	100,320	106,620	6.3	35,540	6,300	29,240
Semiskilled Metalworking	12,070	14,040	16.3	4,480	1,970	2,510
Drill Press Operatives	290	280	-3.4	60	-10	70
Furnace Tenders, Smelters and Pourers, Metal	1,040	1,210	16.3	320	170	150
Grinding Machine Operatives	860	990	15.1	350	130	220
Lathe, Milling Machine Operatives	1,070	1,060	-0.9	200	-10	210
Metal Platers	190	180	-5.3	10	-10	20
Other Precision Machine Operatives	540	640	18.5	220	100	120
Punch Stamping Press Operative	490	520	6.1	110	30	80
Solderers	130	80	-38.5	-20	-50	30
Welders and Flame Cutters	7,460	9,080	21.7	3,230	1,620	1,610
Semiskilled Textile Operatives	380	440	15.8	230	60	170
Spinners, Twisters, Winders	50	70	40.0	50	20	30
Weavers	70	80	14.3	50	10	40
Other Textile Operatives	260	290	11.5	130	30	100
Semiskilled Packing and Inspecting	13,620	15,620	14.7	7,510	2,000	5,510
Checkers, Examiners, Etc., Mfg.	4,150	4,790	15.4	1,730	640	1,090
Graders and Sorters, Manufacturing	810	980	21.0	540	170	370
Meat Wrappers, Retail Trade	1,090	1,410	29.4	850	320	530
Packer, Wrapper, Except Meat, Produce	5,590	6,050	8.2	2,740	460	2,280
Produce Grader, Packer, Except Factory, Farm	1,980	2,390	20.7	1,650	410	1,240
Other Operatives, Except Transportation	74,250	76,520	3.1	23,320	2,270	21,050
Asbestos, Insulation Workers	630	690	9.5	140	60	80
Assemblers	5,490	5,700	3.8	1,630	210	1,420
Blasters	140	140	0	30	0	30

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/ Total	Openings Due To Growth	Openings Due To Labor Force Separations
Bottling, Canning Operatives	1,040	1,070	2.9	340	30	310
Survey Helpers	250	260	4.0	30	10	20
Clothing Ironers and Pressers	1,920	1,980	3.1	1,140	60	1,080
Cutting Operatives, n.e.c.	2,090	2,160	3.3	690	70	620
Dressmaker, Except Factory	1,560	1,820	16.7	1,420	260	1,160
Drillers, Earth	670	660	- 1.5	130	- 10	140
Dry Wall Installers, Lathes	1,210	1,620	33.9	520	410	110
Dryers	50	60	20.0	20	10	10
Filer, Polisher, Sander, Buffer	1,110	880	- 20.7	10	- 230	240
Garage Workers, Gas Station Attendants	8,320	9,260	11.3	1,780	940	840
Laundry, Dry Cleaning Operatives, n.e.c.	2,750	3,400	23.6	2,220	650	1,570
Meat Cutters, Butchers, Except Mfg.	3,180	3,200	0.6	790	20	770
Meat Cutters and Butchers, Mfg.	980	830	- 15.3	60	- 150	210
Milliners	40	30	- 25.0	20	- 10	30
Mine Operatives, n.e.c.	580	480	- 17.2	30	- 100	130
Mixing Operatives	680	710	4.4	180	30	150
Oilers, Greasers, Except Automobile	1,080	970	- 10.2	140	- 110	250
Painters, Manufactured Articles	1,250	1,180	- 5.6	140	- 70	210
Photographic Process Workers	1,010	1,090	7.9	580	80	500
Riveters and Fasteners	1,190	1,130	- 5.0	80	- 60	140
Sailors and Deckhands	1,100	950	- 13.6	50	- 150	200
Sawyers	3,690	4,090	10.8	1,210	400	810
Sewers and Stitchers	3,960	5,130	29.5	3,940	1,170	2,770
Furnace Tenders and Stokers, Except Metal	1,750	1,530	- 12.6	190	- 220	410
Winding Operatives, n.e.c.	540	520	- 3.7	60	- 20	80
Misc. Machine Operatives	15,350	15,370	0.1	3,730	20	3,710
Operatives, n.e.c.	10,640	9,610	- 9.7	2,020	- 1,030	3,050
Transport Equipment Operatives	43,600	50,290	15.8	13,990	6,690	7,300
Boat Operators	230	200	- 13.0	30	- 30	60
Bus Drivers	3,960	5,270	33.1	2,440	1,310	1,130
Delivery and Route Workers	8,590	10,090	17.5	2,880	1,500	1,380
Fork Lift, Tow Motor Operatives	4,460	4,880	9.4	1,070	420	650

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/ Total	Openings Due To Growth	Openings Due To Labor Force Separations
Rail Vehicle Operators, n.e.c.	60	70	16.7	20	10	10
Parking Attendants	480	500	4.2	230	20	210
Railroad Brake Operator and Couplers	960	980	2.1	190	20	170
Railroad Switch Operators	1,190	1,230	3.4	200	40	160
Taxicab Drivers, Chauffeurs	1,450	1,520	4.8	430	70	360
Truck Drivers	22,220	25,550	15.0	6,500	3,330	3,170
SERVICE WORKERS	149,680	172,830	15.5	110,070	23,150	86,920
Cleaning Service Workers	29,870	35,040	17.3	20,360	5,170	15,190
Lodging Quarters Cleaners, Except Private Household	2,580	3,230	25.2	2,540	650	1,890
Building Interior Cleaners, n.e.c.	5,870	6,120	4.3	3,220	250	2,970
Janitors and Sectons	21,420	25,690	19.9	14,600	4,270	10,330
Food Service Workers	54,350	56,450	3.9	30,780	2,100	28,680
Bartenders	4,900	5,120	4.5	1,980	220	1,760
Waiter Assistants	1,860	1,750	- 5.9	200	- 110	310
Cooks, Except Private	15,870	16,250	2.4	7,800	380	7,420
Dishwashers	3,780	4,120	9.0	1,470	340	1,130
Food Counter and Fountain Workers	1,910	1,610	- 15.7	780	- 300	1,080
Waiters	20,540	21,560	5.0	14,870	1,020	13,850
Food Workers, n.e.c., Except Private Household	5,490	6,040	10.0	3,680	550	3,130
Health Service Workers	19,020	24,850	30.7	19,910	5,830	14,080
Dental Assistants	2,420	3,120	28.9	2,830	700	2,130
Health Aides, Except Nursing	2,140	2,890	35.0	2,250	750	1,500
Nurses Aides, Orderlies	9,960	12,250	23.0	9,210	2,290	6,920
Practical Nurses	4,500	6,590	46.4	5,620	2,090	3,530

Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	WORKER NEEDS 1970-1980 2/ Total	Openings Due To Growth	Openings Due To Labor Force Separations
Personal Service Workers	19,960	23,560	18.0	17,020	3,600	13,420
Flight Attendants	1,400	1,870	33.6	2,010	470	1,540
Attendant, Recreation, Amusement	1,370	1,430	4.4	450	60	390
Attendant, Personal Service, n.e.c.	990	910	- 8.1	560	- 80	640
Baggage Porters and Bellhops	270	170	- 37.0	- 80	- 100	20
Barbers	2,820	2,720	- 3.5	1,120	- 100	1,220
Boarding and Lodging Housekeepers	210	30	- 85.7	- 100	- 180	80
Bootblacks	60	30	- 50.0	0	- 30	30
Child Care Workers, Except Private	2,700	4,060	50.4	3,370	1,360	2,010
Elevator Operators	290	130	- 55.2	- 40	- 160	120
Hairdressers and Cosmetologists	6,970	8,540	22.5	7,240	1,570	5,670
Housekeepers, Except Private	1,730	2,220	28.3	1,600	490	1,110
School Monitors	650	840	29.2	480	190	290
Ushers, Recreation and Amusement	260	220	- 15.4	100	- 40	140
Welfare Service Aides	240	390	62.5	310	150	160
Protective Service Workers	13,050	16,650	27.6	6,600	3,600	3,000
Crossing Guard and Bridgetenders	310	280	- 9.7	150	- 30	180
Fire Fighters	3,430	4,800	39.9	1,770	1,370	400
Guards	3,840	4,620	20.3	2,510	780	1,730
Marshalls and Constables	60	70	16.7	10	10	0
Police and Detectives	4,840	6,290	30.0	1,970	1,450	520
Sheriffs and Bailiffs	570	590	3.5	190	20	170
Private Household Workers	13,430	16,280	21.3	15,400	2,850	12,550
Child Care Workers	6,850	8,310	21.3	7,690	1,460	6,230
Cooks, Private Household	250	320	28.0	320	70	250
Housekeepers, Private Household	1,730	2,160	24.9	2,200	430	1,770
Launderers, Private Household	140	140	0	110	0	110
Private Household Cleaners and Servants	4,460	5,350	20.0	5,080	890	4,190

				WORKER NEEDS 1970-1980 2/		
Occupation	1970 Employment	1980 Employment	Percent Change 1970-1980	Total	Openings Due To Growth	Openings Due To Labor Force Separations
LABORERS, EXCEPT FARM	54,120	56,020	3.5	12,850	1,900	10,950
Animal Caretakers, Except Farm	930	1,110	19.4	590	180	410
Construction Laborers	8,430	8,150	- 3.3	990	- 280	1,270
Fishers, Hunters, and Trappers	1,260	1,200	- 4.8	350	- 60	410
Freight and Material Handlers	8,740	9,050	3.5	1,830	310	1,520
Garbage Collectors	650	820	26.2	270	170	100
Gardeners and Groundkeepers, Except Farm	5,700	6,760	18.6	3,440	1,060	2,380
Longshore Workers and Stevedores	2,900	2,900	0	550	0	550
Timber Cutting and Logging Workers	5,320	4,810	- 9.6	320	- 510	830
Stock Handlers	9,050	10,950	21.0	3,430	1,900	1,530
Other Laborers	4,710	4,100	- 13.0	350	- 610	960
Vehicle Washer, Equipment Cleaners	1,880	1,900	1.1	320	20	300
Warehouse Laborers, n.e.c.	4,550	4,270	- 6.2	410	- 280	690
FARMERS AND FARM WORKERS	38,590	38,650	0.2	14,750	60	14,690
Farmers and Farm Managers	18,280	19,370	6.0	9,510	1,090	8,420
Farmers (owners and tenants)	16,870	16,440	- 2.5	7,340	- 430	7,770
Farm Managers	1,410	2,930	107.8	2,170	1,520	650
Farm Laborers and Supervisors	20,310	19,280	- 5.1	5,240	- 1,030	6,270
Farm Supervisors	910	1,180	29.7	580	270	310
Farm Laborers, Wage Workers	18,260	16,900	- 7.4	4,130	- 1,360	5,490
Farm Laborers, Unpaid Family	1,100	1,130	2.7	470	30	440
Farm Laborers, Self-Employed	40	70	75.0	60	30	30

1/ Employment levels for 1970 are based on the 1970 Census of Population. All "not specified" and "allocated" occupational categories have been dropped and are not reflected in the employment totals in this table. The 1970 Census total occupational employment for workers 16 years of age and older was 1,233,063.

2/ Worker needs between 1970 and 1980 represent total job openings due to labor force separations and to growth. These estimates do not take into account openings resulting from worker shifts among occupations or employers.

n.e.c. - Not Elsewhere Classified.

GLOSSARY

Attrition	Job vacancies created by persons leaving their jobs due to various labor separation reasons, which are not being filled.
Demand	Job opportunities or anticipated employment, due to expansion (new jobs) and replacement (filling vacancies caused by separation).
Economic Category (ECC)	Industry categories for which employment projections are supplied to the forecast system.
Expansion	New jobs created by employment growth; a negative expansion indicates a decline in employment from the previous level.
Government Sector	Employment in federal, state and local agencies (excluding active duty military personnel). Government sector employment is specified for a full range of industry categories and not restricted to public administration.
Matrix Segment	Division of census data for each industry and occupation into 12 worker categories. There are 6 worker classes for each sex. The worker classes distinguish the sector of employment.
OE-Program	Educational programs, classified by the U.S. Office of Education (HEW). The forecasting system deals only with those programs applicable to vocational education.
Private Sector	Civilian employment in business and industry other than the government or self-employed sectors.
Replacement	Job vacancies created by persons leaving their jobs due to death, retirement, out-migration, promotion, quits, discharges and other labor separation reasons, which are being filled.
Replacement Rates	Proportion of employment in a given occupational category that will be replaced in a given year. Within the model replacement rates are specified for the occupational categories of the census and computed for the vocational categories of the OE-Programs.
Staffing Ratios	Proportion of employment in a given economic category applicable to a given OE-Program.
Worker Category (WC)	Same as Matrix Segment defined as above.

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